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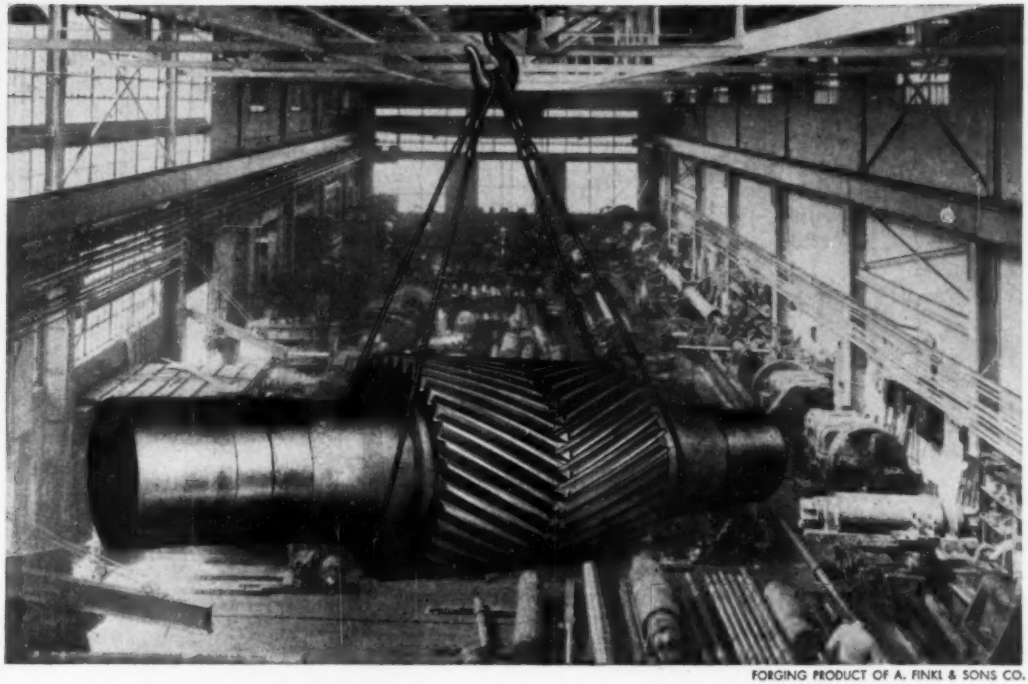

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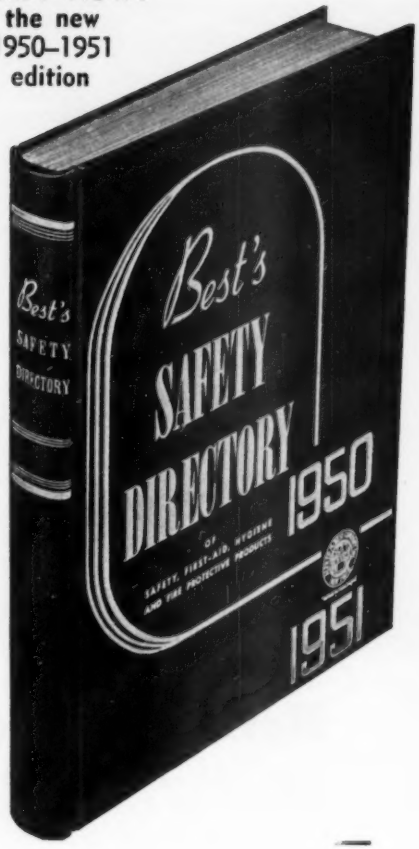

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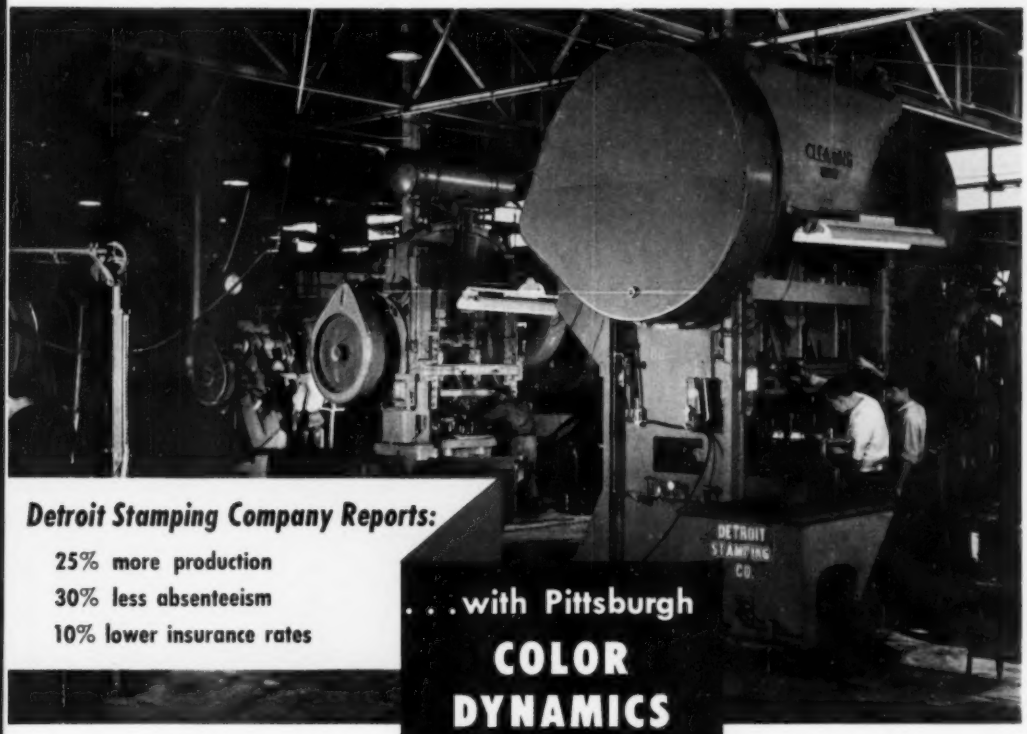

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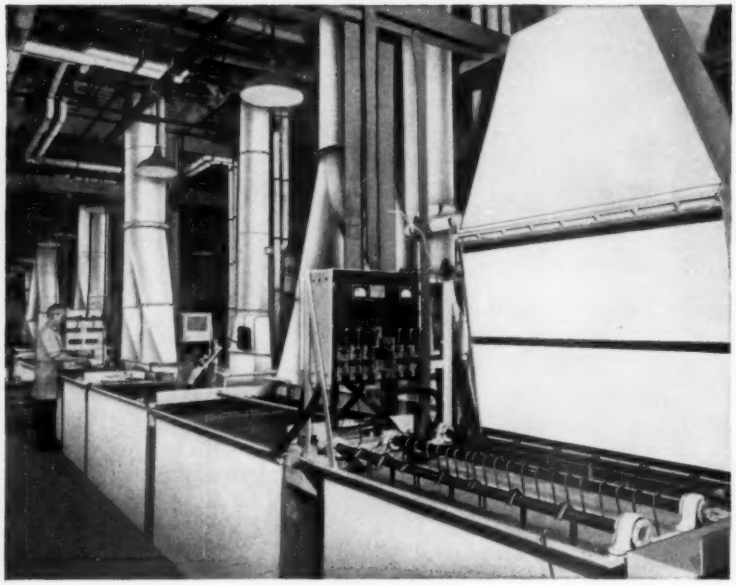

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Reg. U. S. Pat. Off.

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EST. 1901

VOLUME 100, NO. 2 AUGUST, 1950

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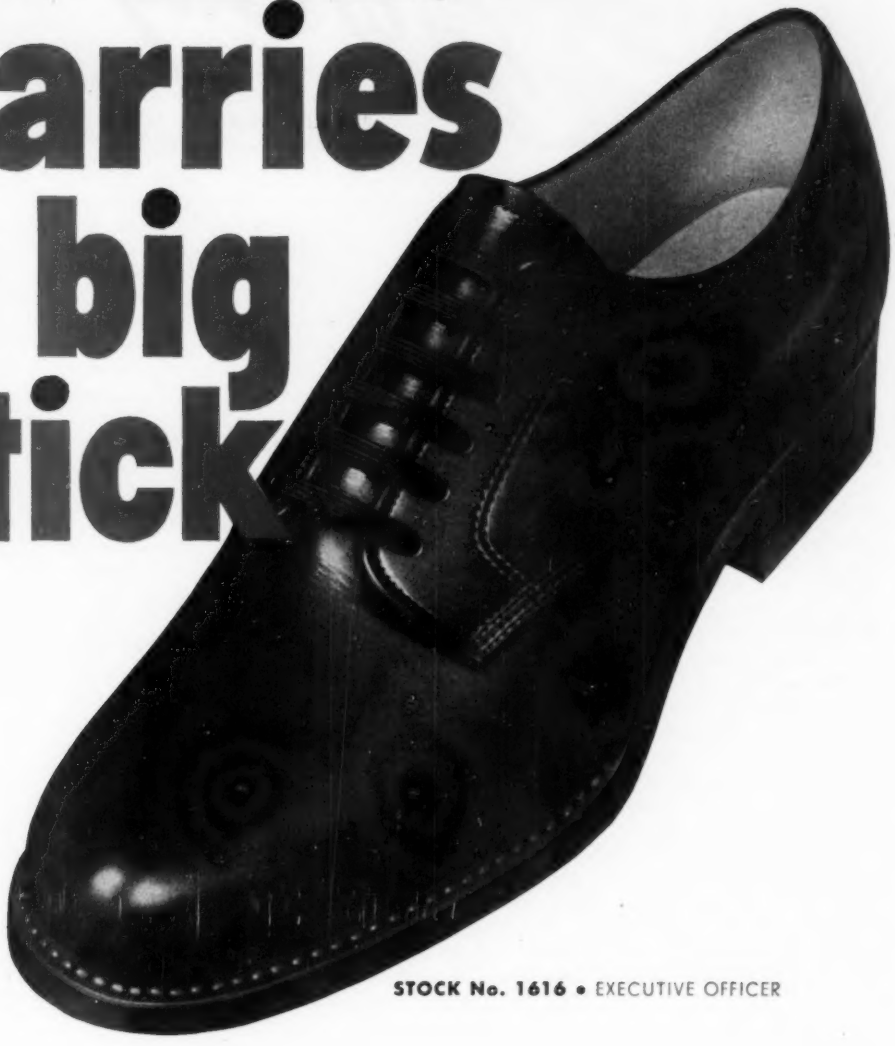
walks softly carries a big stick



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It's Safe to Say

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★ THE BURSTING FLAME

UPON cessation of hostilities in Europe and Japan, this department had no inkling that armed forces of the United States again would be engaged in actual battle within five years. In the interval, the cold war became hotter and hotter and burst into the flame we all have been dreading.

Regardless of political leanings, the overwhelming majority of right-thinking Americans must give their approval to the steps our Government has taken. Tremendous moral courage must have been brought to bear by our leaders in order to reach the only possible decision to combat appeasement, which is but another name for international blackmail and banditry. Through the well-known process of vilification, sabotage of peace measures and all the other obvious tricks of ruthless dictators, we have been jockeyed into the position thrust upon us by Hitlerite Germany of all too recent memory. It follows naturally that our enemies will hurl the charge of war-mongering at the Government of the United States, just as though there were no American military cemeteries scattered over the face of the globe. Obviously, that charge must be broadcast through every available channel as defense mechanism to justify moves designed to shatter the hopes of an early peace.

At this writing, there has been no open declaration of war. In fact we still maintain diplomatic relations with a country whose line of reasoning defies the comprehension of the western world. Nevertheless, our divisions are employed in actual warfare and already casualty lists are beginning to appear in the daily press.

Once again, within the memory of all but the youngest children, the nation is preparing to go on a wartime basis in order to bring the present conflict to an early and successful conclusion. Vacillating policies and tactics of appeasement have become a luxury we can no longer afford. Should our worst fears be realized, at least an open declaration of war will not present a stupefying impact.

Already, there are plans afoot to gear up production of supplies, and this of course means that the safety field will be called upon to repeat a job which was covered with glory during the dark days of World War II. Wheels which have been turning in behalf of civilian consumer goods during the past five years will be speeded up for the benefit of our armed forces and we again will give added emphasis to safeguards for our soldiers on the production line.

The war in Europe and Japan served to spotlight the absolute necessity of preventing accidental casualties on the home front. Untold numbers of lives were saved by the employment of safety measures in war production plants, and no one ever will know the precious time that was saved by safety campaigns which contributed so greatly to military, naval and air force successes a few short years ago.

The conflict in Korea is a stepping stone to permanent peace, and a costly investment in securing for all time the democratic way of life in preference to existence as a satellite of some far-off, totalitarian power. We cannot afford to jeopardize that investment by accidents, fires and poor maintenance conditions in the plants which must stand squarely behind Gen. MacArthur.

It is the hope and prayer of every American family, as well as that of our true allies, that the present disturbance will be short-lived in order to forestall rather than inaugurate a holocaust which might well threaten civilization itself. In the days of World War II we characterized indulgence of industrial accidents as almost traitorous to the aims of our country. Unfortunately, events of recent weeks again give impetus to that accusation.

It is all too easy to say that sped-up production schedules must inevitably bring in their wake an increase in casualties on the home front. That simply is not the truth. Exceptional safety records, often in the most hazardous plants, were compiled in the last war. In fact, military and naval officials of the highest rank were volubly impressed with what could be done with foresight, planning and effort.

The imagination is stunned by the all-too-soon need for *matériel* and the implications behind that need. Fortunately, Americans don't stay stunned for long and if the needs of our country—yes, even for the sake of our lives—demand all-out production, we can do it again without killing off or maiming our soldiers of production.

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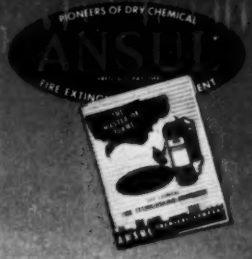

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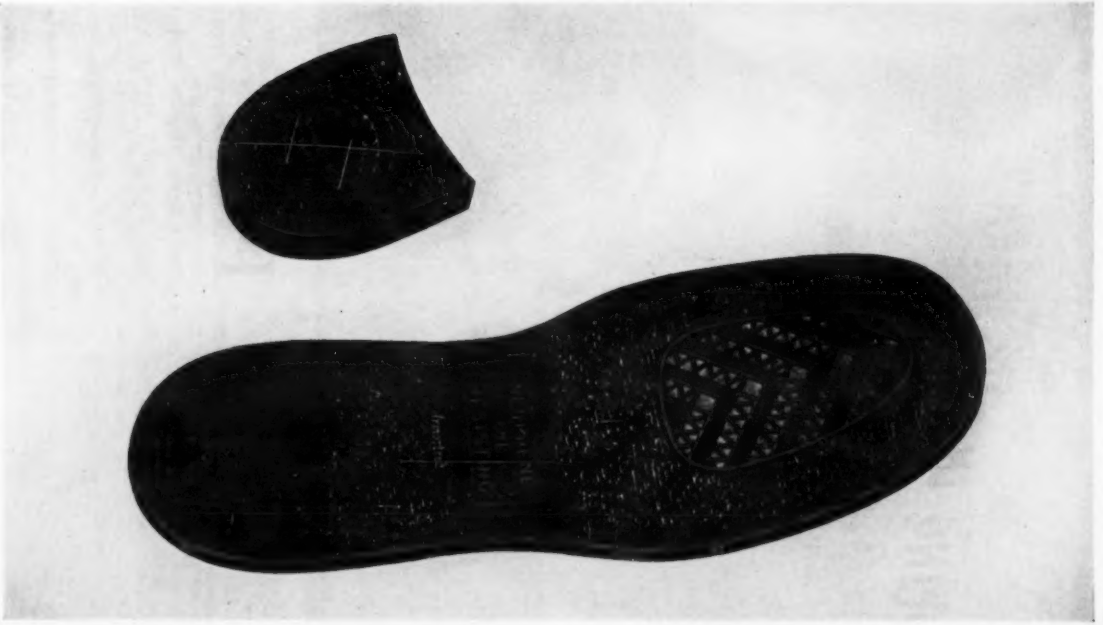

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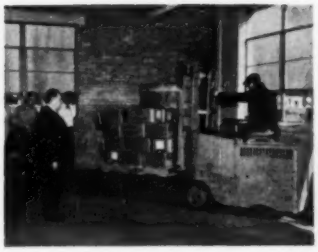
SAFETY ENGINEERING
VOL. 100, NO. 2 • AUGUST, 1950

1. Plant official inspects vicinity of proposed cutting operation, which is at ceiling level.



2. Truck picks up combustibles and moves them safe distance away from torch cutting area.

How to Prevent Welding Fires

PHOTOGRAPHS SHOW THE STEP-BY-STEP SAFETY PRECAUTIONS TO BE TAKEN BEFORE WELDING OR CUTTING IS STARTED

PORTABLE cutting and welding equipment is an indispensable tool for industrial maintenance, repair, and machinery installation. Well designed, carefully manufactured, the apparatus is safe when used in accordance with recognized standards.

Unfortunately, in the hands of careless or improperly supervised workmen, it may become an incendiary weapon, capable of starting fires.

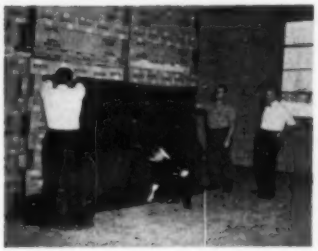
With the beginning of an active post-war change-over period in industry in 1945, the number of cutting and welding fires has climbed sharply, reaching an all-time high this year. Most of the fires were preventable, and emphasize again the need for tightening plant regulations governing cutting and welding procedures.

Precautions Must Be Adequate

Cutting and welding equipment is especially hazardous when used in an area containing combustible material. Even where the danger is recognized and precautions are taken, the safety measures are sometimes not adequate. Sparks often get away and start fires out of sight of the operator. Cracks, pipe holes or other openings seem naturally receptive to the molten globules, which often travel as far as 24 feet.

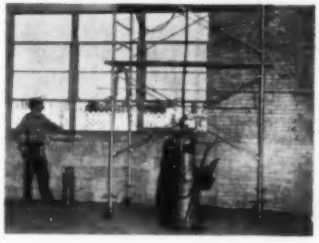
Recently, workmen prepared to weld a conveyor directly over a pile of small rubber tires in burlap bags. Two sheet metal panels were placed over the top of the pile and helpers stood by with small extinguishers. Despite their precautions, the pile caught fire. Extinguishers were ineffective, smoke drove the employees away, and although sprinklers confined the blaze, large hose streams had to be used for an hour to bring the fire under control.

Another fire got the jump on a welding crew working on an unsprinklered paper machine. Extinguishers and small hose were kept in readiness, but when sparks ignited lint, grease, and paper in the machine pit, fire raced over the oily machine before the extinguishers could be used. The blaze was extinguished with large hose streams after *(To page 47)*



3. Storage 25 to 35 feet away is covered by fire-proof tarpaulin to shield it from sparks.

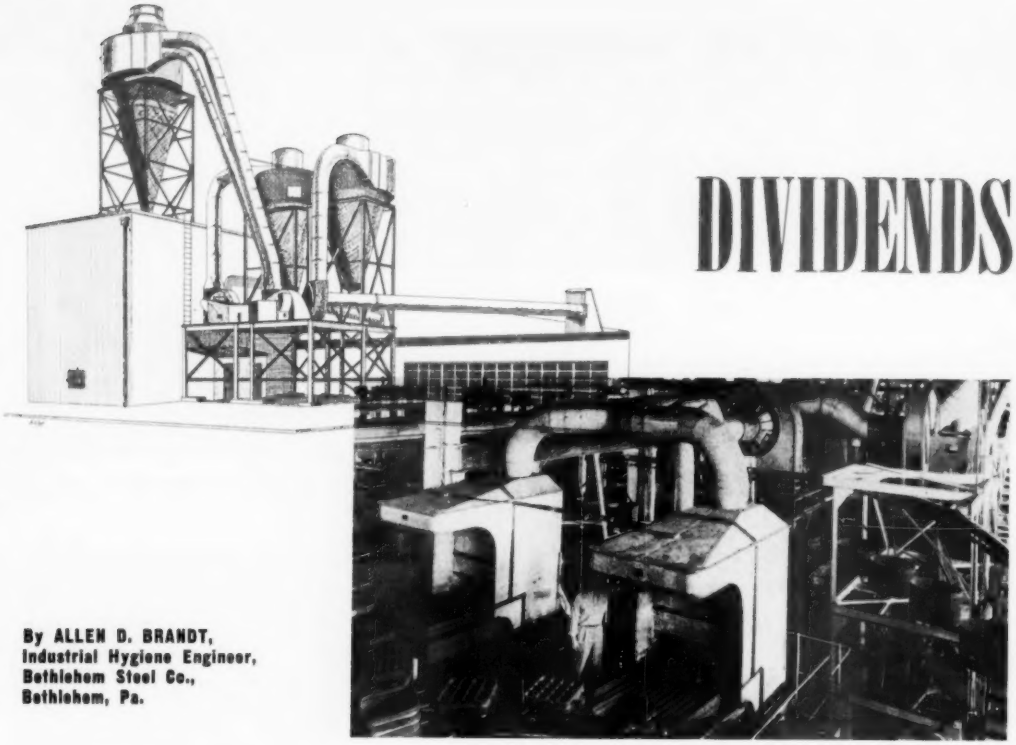
4. With the necessary safety precautions taken, a permit is issued to the operator to proceed.



5. During cutting operation, men stand by with extinguishers, watching for sparks and fire.

6. The cutting operation can now proceed.

DIVIDENDS



By ALLEN D. BRANDT,
Industrial Hygiene Engineer,
Bethlehem Steel Co.,
Bethlehem, Pa.

THE term "ventilation" as defined by the Heating, Ventilating and Air Conditioning Guide is "the process of supplying or removing air, by natural or mechanical means, to or from any space." That, of course, is ventilation in its broadest sense and applies to domestic dwellings and public buildings as well as to industrial factories, mills, mines, shipyards and workplaces of all kinds. This article however, will be restricted to the industrial problems of ventilation with particular reference to that special type of ventilation known as local exhaust or process ventilation.

In the field of dust and fume control, or industrial air sanitation, ventilation plays a very important part, probably more important than any other single method of control. The ventilation used for industrial atmospheric sanitation is of two types, general and local exhaust. Though both types are similar in many respects they are widely different, as a rule, in mode of action. General ventilation, sometimes referred to by the more descriptive term dilution ventilation, functions by keeping the concentration of the dust, fume, mist or gas in the air of the work-space below a safe limit through dilution of the contaminated air with relatively clean air from the outside. Local exhaust or process ventilation, on the other hand, functions by capturing the contaminant at or near its source and preventing it from escaping into the general air of the work-space. Actually, highly contaminated air is captured rather than the contaminant alone but the principle remains the same. Local exhaust systems are, in effect, pneumatic conveying systems and are more like sewer systems than like conventional ventilating systems in that the air handled is usually grossly polluted and is decidedly unfit for human consumption.

It is important that the differences between, and the significant merits of, general ventilating systems and local exhaust systems be fully understood because the use of the wrong type of installation is one of the leading causes of poor returns on the money invested. There is, unfortunately, no distinct and well defined dividing line between the two. Many systems are partly one and partly the other; in fact all local exhaust systems with very rare exceptions are also general ventilating systems. The reverse, however, is not true as a rule. For example, the conventional general ventilating system which supplies air to or removes it from a room by means of a ceiling or wall grill is entirely one of general ventilation; the exhaust systems for woodworking, granite-surfacing, and local exhaust hoods at welding operations are essentially local exhaust systems; whereas most systems at degreasing, pickling and plating tanks are combinations of both with the local exhaust effect predominating as a rule. Possibly the best criterion or means of differentiation is the con-

FROM VENTILATION DOLLARS

Ventilating systems will pay for themselves if they have been properly selected, designed, operated and maintained. In addition, you may get some unexpected dividends in the form of a reduction in production costs.

centration of contaminant in the exhausted air. If it is about the same as, or only slightly above, that in the air of the room, the installation is a general ventilating system; and if the concentration of the contaminant in the exhausted air is way above that in the general workroom air, the system is primarily local exhaust.

To obtain dividends from ventilation dollars it is necessary that (1) the right type of system be selected and (2) that it be designed, operated and maintained properly. In addition to "getting what you pay for," additional dividends in the form of reduced spoilage, decreased cost of production, improved morale, and decreased rate of labor turnover are realized quite frequently.

Selecting the Right System

Local exhaust is a specialized form of ventilating system, and its true place in the realm of atmospheric sanitation is not fully appreciated by many of the people in industry who are responsible for the control of atmospheric contaminants. Therefore, when they are confronted with a dust, fume, mist or gas control problem, they are inclined to think immediately of more ventilation. This has brought about a gross misuse of general ventilating systems in the air sanitation field with resulting waste of money and inadequate control.

It is not difficult to show that general ventilation is not the best solution for controlling major and specific sources of contamination. The ventilation rate must be sufficient to dilute the contaminant (actually the grossly contaminated air) down to a safe level. With many contaminants having maximum allowable concentrations in the order of 1 milligram per cubic foot of air or less and with many operations producing or liberating the contaminant at the rate of one pound per hour or more, it is easy to show that the required rate of general ventilation to keep the average workroom air below a safe level of pollution is in the order of 7600 cfm. Furthermore, only the average workroom air is safe, all workers near the source are still in danger; and if the ventilation rate is increased sufficiently to protect them also, the quantity of air handled becomes very large and may create a difficult heating problem. If local exhaust is used in place of general ventilation, the quantity of air needed to control many major and specific sources of contamination is in the order of 200 to 1000 cfm.

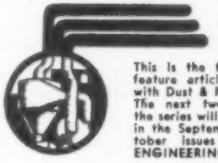
As an example, consider a mechanical spray painting job performed in a bench type booth with a frontal opening 3½ by 6 feet. The articles being coated travel through the booth on a conveyor and are rotated mechanically as they move through the painting zone. Three stationary spray guns directed at different angles coat the articles completely as they pass through, and each gun uses 12 quarts of paint per hour. The most toxic ingredient in the paint is toluol, of which it contains 45%. For spray paint booths of this type, the required ventilation rate is 150 cfm per square foot of frontal opening, or 3150 cfm of air is required to control the health hazard very effectively by means of local exhaust ventilation. If this same operation were done in an open room and general ventilation used to keep the vapor concentration below the harmful level of 200 parts of toluol per million parts of air, 10,400 cfm of air would be required to keep the average room concentration below the safe limit, and a greater ventilation rate would be needed if any workers should be located in the vicinity of the painting operation.

It is readily apparent, therefore, that much better control of specific contamination sources can be accomplished at much less cost by means of local exhaust ventilation than by using general ventilation.

Proper Design

Volumes might be written on this subject alone. It is discouraging, indeed, to *(To page 36)*

FEATURE



This is the first of three feature articles concerned with Dust & Fume Control. The next two articles of the series will be published in the September and October issues of SAFETY ENGINEERING.

DAMAGED

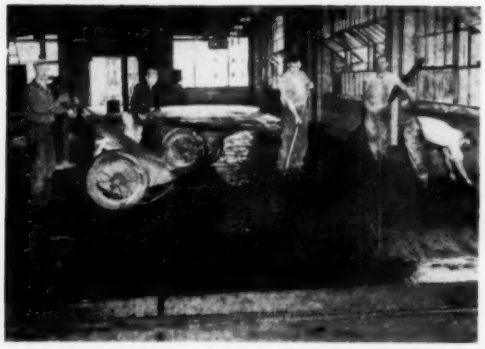


Fig. 1. Making a safe, smooth floor of asphalt mastic after removal of wood sleepers from the concrete, leveling, and a thin resurfacing.

Fig. 2. Mixing asphalt emulsion (clay type) with cement, sand and water for patching. A priming coat is placed first to bond the mastic

By A. J. HEALEY,
Asphalt Products Manager,
The Flintkote Company, New York

IN THIS day of mechanical materials handling, smooth, unbroken floor surfaces are necessary not only to the uninterrupted flow of goods but also to accident prevention. If the plant operator neglects to keep flooring areas in good repair, he is sure to be losing money in lost time and failing in his obligation to provide safe working conditions. And with the modern resurfacing and repairing materials which are both economical and easy to apply, there is little excuse for delaying the remedy.

It is certain, however, that just *any* resurfacing material will not do when it comes to the concentrated, heavy-duty traffic of the industrial plant. The type of flooring described here is unique in that it is a mixture of asphalt *and* cement with other aggregates, and consequently is radically different from concrete made with cement only and bituminous mixes made with asphalt only. Cold process asphalt mastic is not a new type of flooring, having been used extensively over more than a quarter century and in plants of many of America's largest and best-known companies. It is not always identified clearly because of a confusing terminology on the part of many when referring to "mastic," "asphaltic concrete," various cement and bituminous types of pavements and floors. Complex asphaltic compounds and specialty cements are found under a host of names which further shroud a clear understanding of the subject.

Cold process asphalt mastic flooring as described in this article has for its principal ingredient a binder of specially compounded asphalt emulsion in which the emulsifying agent is a mineral colloid. This is a product also known as a "clay-type" emulsion. It differs in many respects from a large assortment of emulsions produced in other ways, or with other emulsifiers. From a flooring buyer's standpoint, that point is important because asphalt emulsions must be stable to perform satisfactorily in floor surfacing. Clay emulsions are recognized as the most stable types available for this use, and their ease of handling minimizes flooring troubles which constitute one of the major problems of plant maintenance.

What Causes Bad Floors or Unsafe Finishes?

Floor failures, whether structural or finish, stem from a multitude of causes. Under-design and the wrong selection of materials of construction for the load and type of services are frequent causes of failures. Wear and accidental damage take their inevitable toll. Obviously, if a floor is laid to service one purpose and is then used for another, failure cannot be charged to the designer. It must be remembered that no single type of floor is a panacea for all ills.

Concrete floors may be laid with poor mixtures, lack of control in workmanship or neglect in curing. Any of these may result in bumps, cracks, dusting, low strength or poor wear resistance. Joints may be poorly spaced or reinforcement improperly installed, resulting in cracking and spalling. Whatever the cause, uneven, broken and slippery surfaces are sources of danger.

Wood flooring seldom provides adequate service under heavy duty plant operation. If wood or light

FLOORS ARE ACCIDENT FLOORS

The quick resurfacing of damaged floors is a factor of safety in an industrial plant. By using cold process asphalt mastic, production is not interrupted and safe walkways are provided.

FEATURE

This is the fourth of four feature articles on Safe Flooring. The first three articles, dealing with Abrasive Fabric Treads, Rolled Metal Plates, and Plastic Floorings, appeared respectively in the May, June, and July issues of SAFETY ENGINEERING.

steel are used structurally, deflection must be taken into consideration in providing a finish that will not crack under it. Steel, too, in plates, grids, castings and stampings has certain limitations, especially when worn smooth and when oil or water is present.

Edge grain wood block, brick and a large variety of compositions are all classed as wearing surfaces and depend upon the quality of bases over which they are installed, as well as upon their own ability. Area failures due to impact loads, wear, water, chemicals or lack of bond between the surface and the base all call for prompt attention by patching or resurfacing.

All in all, it is safe to say that with all the factors that can beset the efficiency and safety of industrial floors, a time for replacement, resurfacing, patching, or other form of treatment, finally arrives. When it is assured that there is structural soundness, one of the most economical methods is a thin section resurfacing with cold process asphalt mastic, provided the floor use is in keeping with the service given by this type of surfacing. Otherwise, if a new covering is required, this type of mastic serves effectively as a leveling course and underlayment for the special finish. If holes or breaks simply need patching, the mastic is also quick and economical. It sets rapidly, may be used in irregular holes, and be featheredged to meet the surrounding floor, thus eliminating the necessity of cutting and chipping out sections of the floor.

Use of Cold-Process Asphalt Mastic

Both slipping and tripping hazards find an answer in properly laid cold process asphalt mastic wearing surface. Being a mixture containing sand, which is harder than the binder of asphalt, this type of floor retains its non-slip characteristics under wear. It resists rutting, rippling or cracking, thus minimizing the occasions for tripping. It is laid without joints and is sufficiently malleable to iron out and heal minor cuts or gouges. It is resilient to resist cracking under deflection of the base and is comfortable to walk on. In addition, cold process asphalt mastic provides a measure of insulation, in that it does not drain body heat or seem cold underfoot.

No extensive preparation of the base is required when installing cold process asphalt mastic. It may be laid over any firm base which is clean and free from oil and grease. A priming coat of asphalt emulsion having the same characteristics (clay type) is used prior to placing the mastic, serving as a bonding agent as well as primer.

Cold process asphalt mastic mixtures are made according to formulae which, *(To page 49)*

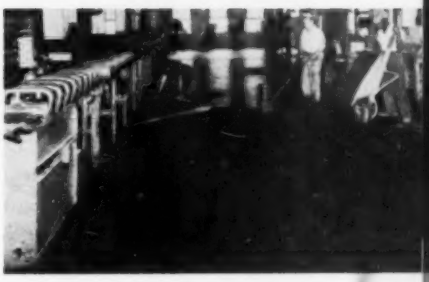


Fig 3. Cold process asphalt mastic surfacing over wood flooring sometimes employs the use of wire mesh which is nailed to the floor.

Fig. 4. Clean floors are a result of good housekeeping, but smooth, unbroken surfaces are a safety factor. This cold mastic flooring was laid over more than half a million sq. ft. at Hibbard, Spencer, Bartlett & Co., Evanston, Ill.

Fig. 5. The safety of smooth, unbroken floors is self evident. With modern materials such as cold process asphalt mastic, floor repairs or resurfacing may be speedily accomplished.

Figure 1. Industrial Gas Mask.

Figure 2. Universal Type Gas Mask with Speaking Diaphragm. Note timer above canister.

Gas Masks Self-Contained Breathing

In order to select the right type of respiratory equipment for the job, a basic knowledge of their construction, uses and limitations is necessary. Here is a summary of two general types of equipment for contaminated atmospheres: gas masks, and self-contained breathing apparatus.

IN GENERAL, respiratory protective equipment falls into three basic categories. These are:

1. Filter-Type Dust Respirators, Chemical Cartridge Respirators and Gas Masks.
2. Air-Supplied-Type, Air-Line Respirators utilizing a source of filtered compressed air or compressed oxygen and Fresh Air Hose Masks.
3. Self-Contained Breathing Apparatus.

This paper is concerned only with Gas Masks which come under the first broad category and Self-Contained Breathing Apparatus under the third category. These types of respiratory protective units are broken down into a number of different forms which will be discussed individually.

GAS MASKS

While gas masks assume many different forms depending upon the type of protection desired, they can be separated into two general classes, the so-called Industrial Type and the Universal Type. All gas masks, however, have certain common limitations, the first of which is the necessity for adequate oxygen in the air being breathed and the second that the concentration of gas, mist, vapor or smoke not exceed the capacity of the canister for filtration. Since the gas mask canister operates largely by means of chemical removal of the contaminant, its service life will be governed by the concentration of toxic gas or gases in the air. The greater the concentration, the faster the chemicals are used up, and the shorter the period of protection for the wearer.

All gas masks consist of a facepiece with lenses, headbands and exhalation valve, a breathing tube, canister and a harness which suspends the canister on the body. In addition, the Universal Type contains a timer. In any gas mask, the toxic material to be filtered is drawn through the canister by the wearer's own inhalation where it is removed mechanically or chemically. The exhaled breath passes through the exhalation valve in the facepiece to the atmosphere.

The Industrial Mask shown in Figure 1 protects against a single gas or group of gases and in some cases also particulate matter, but it is imperative that the user know which gas or group of gases is to be encountered to permit selection of the proper mask which will provide adequate protection. For example, there are canisters which protect the wearer against organic vapors only, ammonia only, or organic vapors and acid gases only. In addition there are many other types of canisters, but the proper one must be selected. With the exception of carbon monoxide, almost all industrial gases can be detected by the senses of either taste or smell and thus the wearer can determine when the canister is losing its power to properly remove the contaminant and will know that the canister must be replaced. With the exception of ammonia from which the proper canister provides protection up to 3 percent, the protection is against a maximum two percent concentration.

The Universal Type Gas Mask (see Figure 2) is the only mask providing protection against carbon monoxide and this protection is for a period of two hours against a maximum concentration of two

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FEATURE

This is the second of a consecutive series of four major articles dealing with Respiratory Protection. The next features of the series will appear in the September and October issues of SAFETY ENGINEERING.

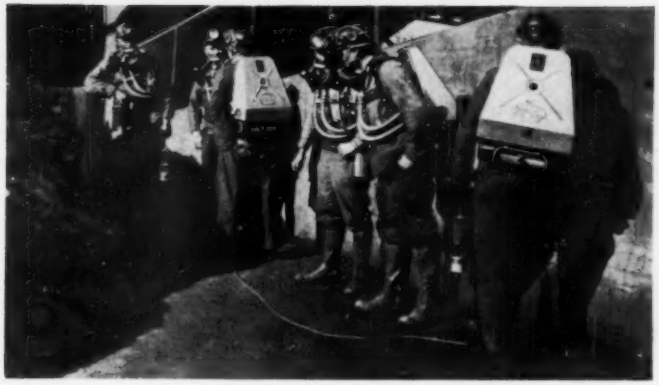

Figure 3. Two-hour cylinder Rebreathing Apparatus in use by members of a mine rescue team.

Figure 4. Back-Type Demand Apparatus.

and Apparatus

By G. L. MORSE,
Product Line Manager,
Oxygen Equipment,
Mine Safety Appliances Co.,
Pittsburgh, Pa.

Figure 5. Demand Work Mask in use.

Figure 6. Self-generating Type Apparatus

percent. Unlike most other gases, carbon monoxide cannot be detected by the senses as it is colorless, tasteless, non-irritating and practically odorless. Thus a timer is provided to indicate the time of use and when the canister must be replaced. This canister like other gas mask canisters can be used intermittently but must be replaced after one year from date of removing the bottom seal, if it has not been consumed earlier. This mask uses a canister containing a series of chemicals as well as a mechanical filter to remove particles such as dust, mists and smoke. The series of chemicals remove all commonly encountered industrial gases; but since there are different types of chemicals, the period of protection against any individual gas is not so long as when a canister designed to remove only that particular gas is used.

As is the case with other respiratory protective equipment, there is an Approval Schedule of

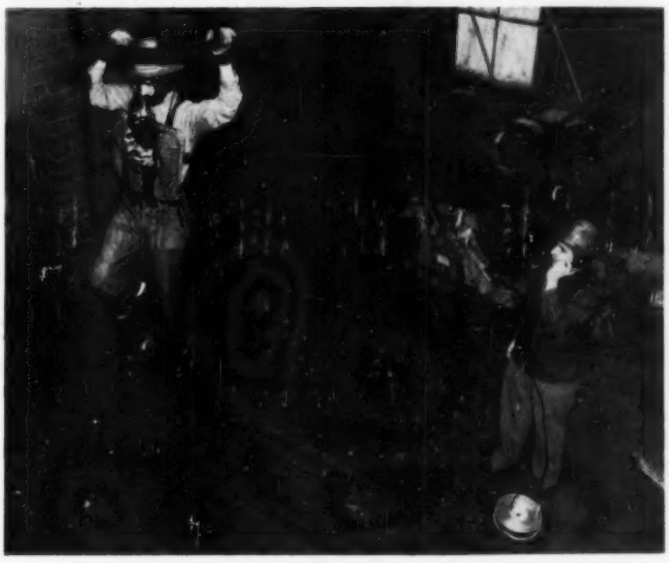

Figure 7. Telephone-equipped Self-Generating Apparatus.

the U. S. Bureau of Mines covering gas masks. This Schedule 14E is the basis for Bureau of Mines Approval, a fundamental requirement to insure adequate protection wherever the Approval Schedule applies. There are certain types of special canisters for specific jobs which may not be approved by the Bureau of Mines, since the Approval Schedule will not apply, but such canisters are the exceptions.

Masks Require Oxygen

As was pointed out earlier, there must be adequate oxygen in the inhaled air to permit proper protection when a gas mask is used because the canister is only a means for removing impurities and provides *no* oxygen. The user gets only as much oxygen as is in the air about him. Therefore he may be completely protected against toxic gases and still be weakened or even asphyxiated because of oxygen deficiency.

Unfortunately there is a misunderstanding concerning gas masks which is sufficiently widespread to be viewed with alarm. This misunderstanding is essentially that any gas mask will protect the wearer. But, as has been pointed out, this is true only when the proper mask is selected for the specific job. This is perhaps most true when military masks designed for protection against war gases and smokes are used for industrial protection against gases for which the military gas mask offers no protection. This is no reflection on the military mask. It provides excellent protection against the gases or smokes for which it is designed, but a feeling of false security may well be worse than no protection. It cannot be too strongly emphasized that a gas mask is suitable only for particular gases, and that judgment should be used in selecting the right type for the job.

In summary, the proper gas mask for the protection desired must be selected, it must not be used in concentrations above its capacity and there must be adequate oxygen in the surrounding atmosphere to sustain life.

Before proceeding to a discussion of self-contained breathing apparatus, another limitation applicable to all respiratory protective equipment should be mentioned. Certain gases are capable of harming the body by means other than through the respiratory tract alone. Ammonia, in concentrations of approximately 3 percent or higher, can cause skin burns, particularly on moist skin. To avoid this possibility, rubberized clothing should be worn in addition to the proper respiratory protection when ammonia in high concentrations is encountered. Similarly, protective clothing should be worn when appreciable amounts of hydrocyanic acid gas are present. Hydrocyanic acid, which is a gas at slightly above room temperature, is capable of penetrating the skin and causing systemic poisoning, although to do so, concentrations considerably higher than those required for poisoning through the respiratory tract must be present.

SELF-CONTAINED BREATHING APPARATUS

Self-Contained Breathing Apparatus provide complete respiratory protection in any concentration of toxic gases and under any condition of oxygen deficiency. The wearer is independent of the surrounding atmosphere since he is breathing in a system in which no outside air is admitted and the oxygen or air supply of the apparatus itself takes care of respiratory requirements. Such devices enable man to work in places where he is, by nature, unfitted to live.

Self-Contained Breathing Apparatus are divided into three basic types which are again broken down into a number of variations. The three basic types are:

1. Oxygen Cylinder Rebreathing Type
2. Demand Type Apparatus
3. Self-Generating Type

Oxygen Cylinder Rebreathing Type Apparatus in use today are almost without exception lung-governed and consist of a relatively small cylinder of compressed oxygen, reducing and regulating valves, a breathing bag, a facepiece or mouthpiece and nose clip, and a container with a chemical which removes carbon dioxide from the exhaled breath. The Self-Generating Type also uses the principle of rebreathing, but functions in a much different manner since it *(To page 45)*

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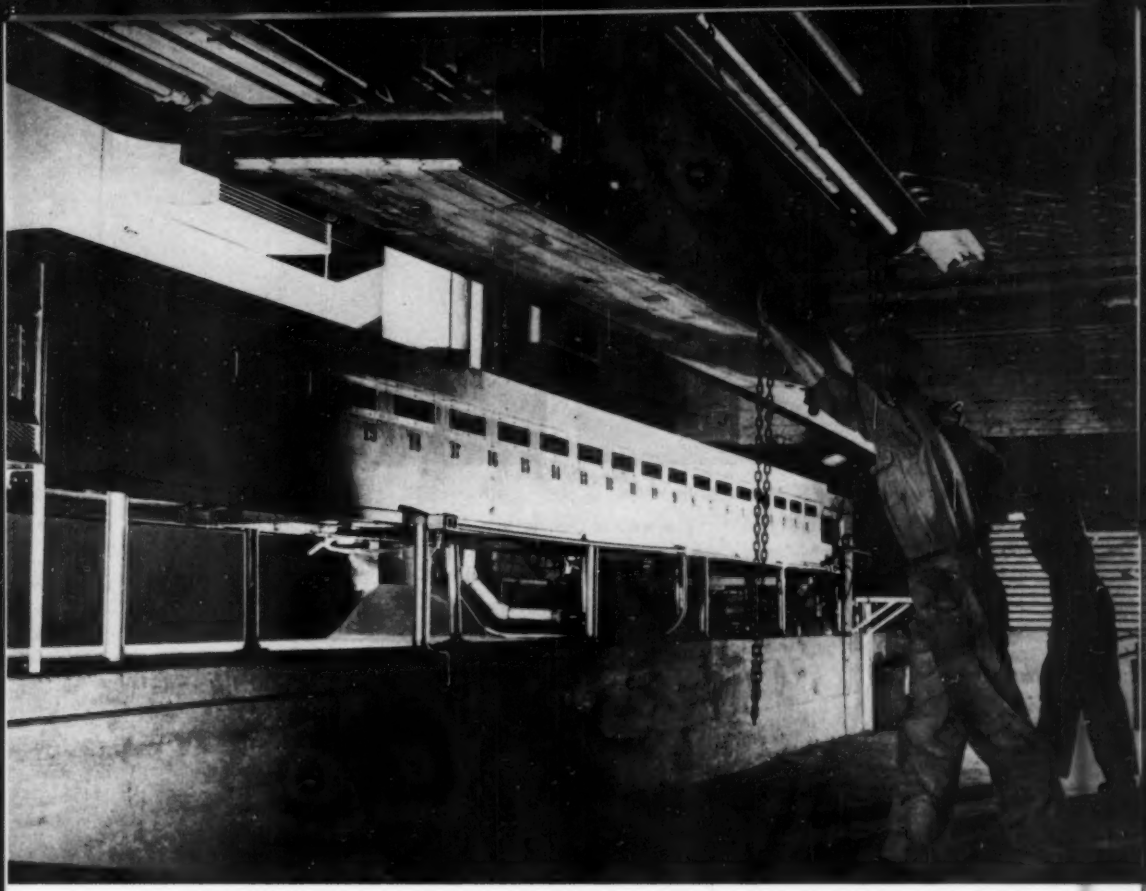


Technicians place the furnace top in position. The test material is attached to the underside of the top.

When It Pays To Play With Fire

How Underwriters' Laboratories, Inc. Uses Fire to Prevent Fires

THE three hundred guests who were staying at the Big City Hotel felt secure in the substantial looking building, with its sturdy steel frame and thick brick walls. Besides, many of them had noticed that the hotel was advertised as "Absolutely Fireproof."

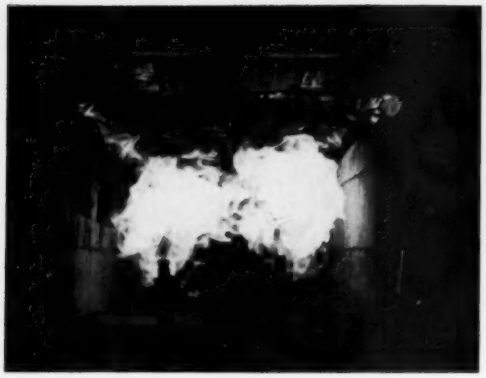
Just before dawn, many of these same guests were awakened by the smell of smoke and the sound of crackling flames. Fire swept through the hallways of that "Absolutely Fireproof" hotel, eating away the painted burlap and wallpaper which covered the walls, and the wooden trim. The flames swept into many rooms, greedily consuming furniture, drapes, and blinds.

Scores of people died within three hours in this inferno. But the shell of the building remained, structurally sound. Technically, it was a "fireproof" building. Fireproof as a stove.

The owners had forgotten that contents and trimmings of a well-constructed hotel will burn just as rapidly as the same combustible furnishings in a frame firetrap. The good, fire-resistive building had been filled with tons of fast-burning fuel.

As one fire prevention expert observed, using combustible materials within a concrete-and-steel building is as foolish as "stacking a couple of carloads of firewood in the lobby and then just hoping that nobody would light it accidentally."

Many of the worst fire tragedies in American hotels, apartment houses, and homes have been traced to this one cause—placing too



Furnace interior showing action of flames against the sample.

An engineer examines the charred surface of the test sample.

many fast-burning furnishings and decorations in an otherwise firesafe building.

Often other slower-burning materials could have been substituted easily—but contractors and builders had no complete charts to indicate which materials were safest and which were most hazardous.

Testing for Flammability

A unique furnace has been developed in the Chicago laboratories of Underwriters' Laboratories, Inc. to supply that needed information. The controlled fires in that furnace will help prevent thousands of fire deaths during the next few years if builders and contractors apply the knowledge conscientiously and if citizens insist that safety standards be observed.

The engineers in this nonprofit laboratory developed this furnace after much study and experimentation. It is a steel shell lined with fire brick, and looks like a chimney which has been tumbled over and laid out lengthwise along the floor of the laboratory. It is twenty-five feet long.

The furnace is actually quite simple in design. The topmost wall can be detached completely, and a sample of the building material which is to be tested is then attached to the underside of this wall. The sample is 20 in. wide and 25 feet long, which allows enough material for a conclusive test of the speed with which it will burn.

The wall is then returned to its position, and the test begins. A gas-burner is lighted at one end of the furnace, and a breeze which is strictly regulated to blow 200 feet per minute sweeps the flames from this burner along the length of the furnace.

An engineer stands by with a stopwatch, and his assistants keep their eyes on several special instruments. They are looking for the answers to three questions:

How fast will this material burn?

How much smoke will it produce?

Will it make a fire worse by contributing to the rapid spread of flames to other materials?

The answers to those three questions will tell whether a certain material is suitable for use in future factories, hospitals, hotels, and homes. If it burns too fast, the inherent danger is obvious. If it creates too much dense smoke, this characteristic might cause many deaths and would also make it more difficult for victims to escape and for firemen to fight the flames. And if it contributes much fuel to the fire, then it will naturally make any small fire bigger and any bad fire still worse.

In order to assure accurate answers to these questions, conditions in the laboratory are very carefully controlled. The room temperature is held steady, and even the moisture content of the air is regulated. Slight changes in temperature or humidity can affect the speed with which materials burn.

Classifying Materials

In classifying the materials which have been tested, a comparison is made with two common materials: asbestos cement board, and red oak wood.

The asbestos cement board does not burn so it is rated at "zero" in regard to speed of flame, contribution of fuel to a fire, and production of smoke. Red oak wood, which is a standard building material, is classified as "100" on the rating chart. Other materials are then rated by comparison with these two standard materials.

Thus a material which receives a rating of "50" will burn over its surface half as far in the same time as does untreated red oak wood. A material listed at "200" would spread flames twice as rapidly as red oak wood.

Paints and wall papers can be rated, as well as composition wall board, fabrics, papers, and insulating materials.

One promising development of recent years has been the chemical treatment of some materials in an effort to reduce their burning characteristics. The reliability of each of these treatments can now be determined by this standardized test.

In the future, conscientious builders and *(Continued on page 40)*

It's EASY to install "Payroll Savings"

If you've put off installing the Payroll Savings Plan in your company because you feel it would be "a lot of work," then this advertisement is certainly for you! Because it's really *very simple* to give your employees the advantages of investing in U. S. Savings Bonds the easy, automatic "Payroll" way.

. . . and 20,000 companies' experience proves it pays!

HERE'S ALL YOU NEED TO DO

Appoint one of your top executives as Savings Bond Officer. Tell him to get in touch with your State Director, Savings Bonds Division, U. S. Treasury Department. Here's what happens . . .

The State Director will provide application cards for your employees to sign—plus as much promotional material and personal help as necessary to get the Plan rolling in your company.

Those employees who want Savings Bonds indicate on the applications: how much to save from their pay; what denomination of Bonds they want; and the inscription information to appear on the Bonds.

Your payroll department arranges to withhold the specified amounts, arranges to get the Bonds, and delivers them to the employees with their pay.

The Bonds may be obtained from almost any local bank or from the Federal Reserve Bank or may be issued by the company itself upon proper certification by the Federal Reserve Bank or Branch in the company's District.

THAT'S ALL THERE IS TO IT!

In case you're skeptical as to how many of your employees would like to have Payroll Savings, canvass your plant—and be prepared for a surprise. (Remember that pay-check withholdings for Bonds are *not* a "deduction"—the employee takes home his Bonds with his pay.) One leading manufacturer, who had professed little faith in the Plan, found his eyes opened when he asked the people in his plant whether they would like to obtain Bonds in this way. Within only six months after he installed the Plan, half his employees signed up. A prominent aircraft manufacturer, whose company had used the Plan for some time, was not aware of its potentialities until his personal sponsorship increased participation by 500% among his company's employees.

THE BENEFITS ARE BIG—FOR EVERYONE

The individual employees gain security—they know that the Bonds they hold will return $4 for every $3 at maturity. The company gains from the resultant increased stability and efficiency of its workers. The whole nation gains because Bond sales help stabilize our economy by spreading the national debt and by creating a huge backlog of purchasing power to boost business in the years ahead.

Is it *good policy* to deprive your company of Payroll Savings—even one more pay day? Better at least have a talk with your U. S. Savings Bonds State Director, get the answers to your questions, and *know for sure.*

The Treasury Department acknowledges with appreciation the publication of this message by

SAFETY ENGINEERING

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

TRANSPORTATION

Fleet Supervisor's Course

APPROXIMATELY 50 men who supervise fleets of busses, taxis, and trucks are expected to attend the 12th annual Motor Fleet Supervisor's Course, at State College, Pa., September 11–15. Sponsored by the Institute of Public Safety of the Pennsylvania State College, the Course will help supervisors organize and carry through a training program for new and in-service drivers. Methods of reducing accidents, cutting costs, and increasing profits will be stressed in addition to building better public relations.

Attending the Course will be fleet owners and operators, dispatchers, terminal managers, safety and personnel directors, training directors, and others interested in safe and economical operation of motor vehicle fleets.

Supervisors will learn how to pick good drivers, how to train them, how to supervise them, and how to maintain interest. Each enrollee will be given a practical "Driver Training and Accident Prevention Workbook." This book eliminates guesswork, and simplifies the procedures for setting up a workable program. It covers what to do, how to do it, where to begin, why each step is needed, what material and equipment is required, and what savings can be anticipated.

Bus and taxi operations and special problems of other fleets will be dealt with in an evening of scheduled consultations. Each enrollee will be assisted in developing a program to meet his particular problems.

Transit Awards

TWENTY-TWO transit companies throughout the United States were honored by the American Transit Association for outstanding passenger and traffic safety records during 1949.

Julien H. Harvey, Managing Director, Accident Prevention Dept., Ass'n. of Casualty and Surety Companies, and chairman of the Association's award committee, made the presentations to winners at ceremonies in Washington, D. C.

In introducing Mr. Harvey, Guy C. Hecker, Executive Manager of the Association, cited the unusual safety records being made by transit companies despite rapidly mounting totals of all types of passenger and commercial vehicles on city streets. This is attributable, he said, to the improved selection of personnel, intensive training, retraining and supervision, and careful maintenance throughout the industry.

In support of the statement, Mr. Hecker pointed out that the 22 award-winning companies showed a 15.1 per cent decline in 1949 traffic accidents as compared with 1948.

Top awards in each of the population groups set up under the Association's annual transit safety competition were presented to the following six companies:

Capital Transit Co., Washington, D. C., Group I—serving over 600,000 urban population; San Diego (Cal.) Transit System, Group II—250,000 to 600,000 population served; South Carolina Electric & Gas Co., Columbia, S. C., Group III—100,000–250,000; Springfield (Ohio) City Lines, Inc., Group IV—30,000–100,000.

Top honors in Group V, which includes companies serving both urban and suburban populations of 30,000 and over, were shared by Philadelphia Suburban Transportation Co., Upper Darby, Pa., and the Bergen Division, Public Service Coordinated Transport and Interstate Transportation Companies of N. J.

A new "Special Citation" was presented to Oshkosh (Wisconsin) City Lines, Inc., for outstanding reduction in traffic accidents. The Oshkosh company cut its '48 total by 62 per cent in 1949. A second "Special Citation" was awarded to Georgia Power Company of Atlanta for showing a 43 per cent decrease in passenger accidents during 1949 as compared to the previous year.

Recognition was also given for high achievement with Certificates of Honorable Mention. Transit safety awards have been presented since 1914, and are among the oldest safety honors in the country. Originally sponsored by the American Museum of Safety, the transit industry took over direct sponsorship in 1941, under the title of American Transit Safety Awards.

Date Change for Meeting of Highway Research Board

THE 30th Annual Meeting of the Highway Research Board of the National Research Council will be held in Washington, D. C. from Jan. 8 to Jan. 12, 1951. Headquarters will be the building of the National Academy of Sciences. Program plans are well under way and an outstanding program of papers and reports on highway research subjects is assured. Details will be announced at a later date. The change from the Board's usual December meeting dates is necessary to avoid conflict with other important meetings involving highway engineers and administrators which are scheduled for December, 1950.

Are Big Trucks Safe?

Vehicle Size and Weight in Relation to Highway Safety

By GOLEY D. SONTHEIMER,
Director of Safety,
American Trucking Associations, Inc.

PART 3

Are trucks unmaneuverable?

(Continued from the July issue of SAFETY ENGINEERING)

TO THE average motorist maneuverability of a vehicle is directly related to its size. This belief is a fallacy and is so proven even in the passenger car field. Many large cars will turn in the same radius needed for the small car. Trucks in this country have been designed and are now in use which will make a U turn in a 19 foot wide street. Most commonly used truck and combinations will turn corners in the allotted space at the average city street intersection. Truck size in this country varies from the familiar small panel truck which has a length approximately the same as the average passenger car—16 to 18 feet—all the way to the 58 to 60 foot truck and full trailer combination. The straight truck used in the trucking industry which is seen commonly on the city streets will maneuver in approximately the same space as the passenger car. The greatest variance between the two is shown in parking the units parallel to the curb. The straight truck can be parked in this manner as easily as the passenger car, but because of its additional length longer parking space is necessary.

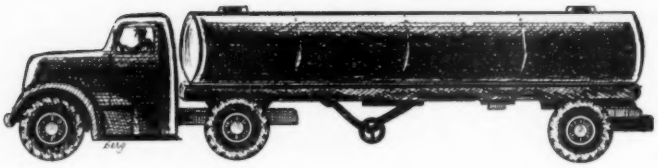
The average tractor semitrailer combination which varies from 40′ to 45′ in length needs only a slightly wider space in which to make a right angle turn than the passenger car or the straight truck. In making such a turn the semitrailer wheels may "off truck" from the path of the power unit as much as 2 feet. These combinations can turn with ease within the width of traffic lanes provided on the highways and most city streets. The large units, that is, the 60 foot truck and full trailer combinations maneuver as readily as the tractor semitrailer units. In making a turn the full trailer follows substantially in the path of the straight truck which provides the power for the combination.

Maneuverability of trucks and combinations is proven in the American Trucking Associations' Truck Roadeo. In this driving skill contest, tests are set up that simulate problems which the truck driver meets in his day to day work. Most of these tests are operated on simulated streets 40 feet in width. The contestants must park their vehicles parallel to the curb on such a street and they must back into a 10′ wide alley from a 40 foot wide simulated street. In one of the tests the driver must back a 45 foot combination in and out through barrels set up at 34 foot intervals (a space 11 feet shorter than the truck) and then drive forward through them. This test is run on a 50 foot wide street. Another test is run on what would be no more than a twenty foot wide street. This is the offset alley test in which the driver must drive his vehicle through a set of 10 foot wide alleys one of which is set ten feet to the left of the other and no more than the length of the vehicle from the first alley. In another test the vehicle must be maneuvered through a set of barriers between which the clearance diminishes from 9 feet to 6 inches at the opening to 8 feet and 2 inches at the point where the vehicle emerges. The latter space is only 2 inches wider than the vehicle. Not less than 45 feet from the last set of barriers is a line at which the vehicle must come to a stop, and the driver must come within six inches of that line to get a perfect score. The trucks and the combinations can be maneuvered through all these tests; otherwise the contest would not be fair to the drivers. Of course the drivers must be skilled, but this is a definite requirement in any contest involving people. This driving skill has much, if not everything, to do with the safety record of the trucking industry.

And some outstanding records have been set in safe operation in the industry.

The record of passenger car operations is judged by the number of traffic fatalities per hundred million miles of travel without regard for the millions of accidents that result in property damage and injuries. Also those fatalities must occur on public thoroughfares to be counted.

The trucking industry uses a tighter measurement because from the small property damage accident it can set a course to eliminate the more serious accidents. Correcting driver faults *(To page 32)*



By ALBERT A. MOREY, Vice President, Marsh & McLennan, Inc., Chicago, Ill.

IN THE field of transportation of petroleum products, technological development in the past quarter century has made a substantial advance and at first would seem to counteract the importance of the human factor . . . *but it has not*. Actually, quite the contrary is true. Man still continues as the basis for productivity, and in our post-war planning, it has become even more necessary to consider the human element.

In the field of ALL transportation, each year sees fewer accidents caused by equipment failures. This is, of course, exceedingly gratifying, and we should be proud of man's experience and ingenuity.

And then we pick up a newspaper and read where a plane has crashed and killed all on board, or where a train has run through a block signal, killing and injuring many, or where a driver of a tank truck has plowed through crossing gates, killing the driver, destroying the tractor trailer unit and setting fire to the engineer and cars. These are all *human* errors and *human* failures.

A thoughtless act here and there . . . a lapse of memory for a few seconds . . . just a nod at the wheel . . . and death and destruction litter the highway.

More and more the safety engineer's attention is being directed to the control of human behavior. The job today . . . and tomorrow too, or until we can devise a foolproof human robot . . . is to eliminate those habits and practices which foster indifference and lack of clear thinking on the part of the worker or driver.

In my association with a large nationwide organization which is responsible for the working out and placing of various forms of insurance for large concerns engaged in the field of transportation of petroleum products, it has been necessary to make many analyses of accident reports. The great preponderance of accidents caused by human failure continues to amaze me. Recently, in analyzing the accidents of a large company handling Butane and other liquefied petroleum products, 92 per cent of the accidents could be charged directly, or indirectly, to human errors. They resulted from the UNSAFE ACT, not from equipment failure.

Who Is Responsible?

In viewing a situation such as this, it makes one wonder if somewhere along the line those charged with the responsibility of safety have not slipped. The inevitable conclusion is that those responsible . . . and it includes many individuals in any one company . . . are not selling the safety program properly. Perhaps a few searching questions are in order:

1. Are those responsible prepared? Do they know how to arouse the necessary enthusiasm so that an employee *wants* to prevent accidents to himself and others?
2. Have they been amiss in presenting the safety plan? Has full advantage been taken of publicity and participation?
3. What about top management? Are those who bear the safety responsibility getting management's full cooperation? If not, then they have only themselves to blame, for there is no management in industry who will not give the safety department the necessary backing.

When top management is sold on the benefits of a sound safety program, the problems of the safety director are somewhat easier in selling the plan to employees. Over the years, a comparatively new industry, the airlines in this country, comes in for much praise for they are doing a good job on safety, and their inherent hazards are greater than in the field of transportation of petroleum products.

A case in point is Eastern Air Lines. Captain Eddie Rickenbacker says: "Spend freely to maintain planes and stimulate the thought of safety so that each employee of Eastern's far-flung empire will fully realize the impor-

OIL TRUCK ACCIDENTS — THEIR CAUSES AND CURES

tance of preventing accidents . . . to themselves and to the public." Eastern has consistently made money down through the years. There is no question but that safety is very much a part of Eastern's profit formula. It is necessary, however, that top management work as hard on the problems of safety and be just as interested as the safety director, the chairman of the safety organization, the committee members, and, in fact, any employee.

Again, getting back to Eastern, witness what Captain Eddie does with his "spare time." He runs the airline from his briefcase as he rides endlessly and unheralded over his 85-city route like a hawk-nosed circuit court judge, dispensing advice on safety and other items in order to keep Eastern's operations safe and on the profit side of the ledger. No matter how small an accident is, the station managers are confronted by a stern Rickenbacker. The other airlines in this country are following the same formula, and this is the reason why airline travel is becoming such a safe means of transportation. It shows what can be accomplished when top management is sold and the safety thought is passed down to each and every employee.

Petroleum Transportation Accidents

To help prevent future accidents, one of the best ways is to analyze past accidents and see what the basic causes are. Table 1 is an analysis of accidents covering twelve months experience. It is the actual record of a large trucking company.

TABLE 1

		Other Party Liability
1. Side-Swipes	24%	16%
2. Fixed Object	22%	3%
3. Rear End	18%	7%
4. Faulty Equipment	9%	..
5. Right Angle	7%	4%
6. Jack-Knife	6%	1%
7. Head-On	3%	2%
8. Backing	3%	1%
9. Fire	3%	..
10. Miscellaneous	5%	3%
Totals	100%	37%

Side-Swipes

The predominant type of accidents for the one-year period of this trucking company were side-swipes, resulting in 24% of the total accidents. It represents a lack of proper care in passing or meeting other vehicles. On-coming vehicle accidents result from the failure of the other driver to keep on his side of the road. But there is also evidence that truck drivers are often guilty of the same failure. Riding the center line is one of the most commonly heard complaints against truck drivers.

Drivers should understand the importance of:

1. Always keeping to the right.
2. Watching for the actions of oncoming drivers.
3. Being prepared to slow down, stop, or pull over onto the shoulder to avoid an accident.
4. Maintaining sidemarker lights clean and in working order.

The side-swipes while overtaking another vehicle indicate lack of proper care in passing. The decision to pass rests with the individual driver. Good judgment is necessary every time to do it in safety. Passing with a truck is normally a serious business even under the most favorable conditions. To pass safely, the driver must consider the following factors:

1. The size of the equipment.
2. There must be adequate clear distance ahead to pass and return to the right-hand lane.
3. Check for overtaking vehicle before pulling out to pass.
4. Warn other driver of intention to pass: horn signals by day, horn and light signals at night.
5. The danger of hills, curves and other places where sight distance is restricted.

To be continued in the September, 1950 issue of SAFETY ENGINEERING.

From an address presented at the Twenty-Seventh Annual Midwest Safety Show.

New Research Laboratory Opened By M.S.A.

World's largest research laboratory devoted exclusively to the development of safety equipment was dedicated in Pittsburgh by the Mine Safety Appliances Company. About 400 leaders in the safety movement, as well as industrial executives, attended the dedication ceremonies.

THE world's largest research laboratory devoted to the development of safety equipment for all industries was dedicated in Pittsburgh, June 14, by the Mine Safety Appliances Company. About 400 leaders in safety and industrial hygiene and health, as well as top industrial executives, attended the dedication exercises.

Principal speaker at the ceremonies was Ned H. Dearborn, Chicago, president of the National Safety Council. Mr. Dearborn hailed the opening of the laboratory as one of the most significant advancements in the history of this country's industrial safety movement. In this laboratory, Mr. Dearborn stated, we have the embodiment of science at its best, and human purpose at its finest.

He described the laboratory as a physical plant and human organization forming a sharp keen instrument of commerce and industry and scientific investigation whose ultimate worth will be measured by the number of men and women who will live longer because of it.

The new laboratory was dedicated to the memory of John T. Ryan, international pioneer in the field of industrial and mine safety, and co-founder of Mine Safety Appliances Company. Mr. Ryan died in 1941. George H. Deike, president of the company and original partner of Mr. Ryan in its founding 36 years ago, traced the firm's history. Mr. Deike and Mr. Ryan had been engineers in the Mine Rescue and Recovery Division of the U. S. Bureau of Mines shortly after the bureau was established at Pittsburgh in 1910. Their experiences at mine fires and explosions, Mr. Deike said, led them to start a company supplying apparatus, equipment and instruments to protect lives and property.

Since 1914, the company's activities have expanded from mining into all branches of industry on a worldwide scale. Today, the company is the largest manufacturer and supplier of safety equipment in the world. Facilities of the new laboratory will be used in developing equipment and devices to combat hazards of all types. Constantly changing industrial processes bring new hazards that must be overcome by new safety equipment, Mr. Deike pointed out.

Safety equipment and instruments for use in such relatively new fields as air pollution and atomic energy are among the projects planned in the laboratory. There also will be continuing research to improve existing safety devices and rescue apparatus. Virtually every branch of science and engineering is utilized at the laboratory for developing protective equipment and instruments. The laboratory is staffed by chemists, physicists, electrical engineers and other scientists.

In the four-story laboratory building are many types of research instruments and equipment. These include high altitude chambers; dust, fume and gas chambers; a wind tunnel, and an electron microscope that permits study of dusts and other substances at a magnification up to 100,000 times. The library of the new laboratory contains a comprehensive collection covering the fields of safety and industrial health and hygiene. An experimental shop on the ground floor manufactures new models of instruments and equipment developed through research.

Director of Mine Safety Appliances Company's Research and Development is Dr. William P. Yant. A member of many technical societies and associations, he was the first president of the American Industrial Hygiene Foundation. In 1946, he received the Pittsburgh Award of the American Chemical Society for distinguished service to chemistry. Recently, he was appointed chairman of the steering committee of the U. S. Technical Conference on Air Pollution.

Following the dedication exercises, guests were taken on a tour of the new laboratory to witness demonstrations and exhibits of research and testing procedures. The company displayed its entire line of safety equipment, hundreds of products ranging from tiny first aid kits to a complete mobile laboratory for air pollution surveys. The

Industrial leaders, as well as safety directors and public health officials, attended the dedication of the new safety research laboratory. Here, Harry S. Moses (center), president of H. C. Frick Coke Company and new head of the coal operators association, examines a miner's cap lamp. On his right is George H. Deike, president and co-founder of the Mine Safety Appliances Company. On his left is John T. Ryan, Jr., executive vice president of MSA.

"Is it too late, Doctor?"

Sooner or later, one out of every five living Americans may ask his doctor this question about cancer.

THE answer may be: "Yes . . . I'm afraid so . . ."

But, today, the doctor can say to increasing numbers of cancer victims, "No, it is by no means too late . . . There is much that we can do . . . In fact, your chances for recovery are good."

This heartening reply reflects the great progress of medical science against cancer. And there is every reason to believe that, as the years go by, the ancient dream of conquering this disease in all its forms will be realized.

Cancer research supported by the American Cancer Society has already yielded new surgical techniques and improved methods of using x-ray and radium. More recently, research with radio-active isotopes has revealed facts about processes heretofore completely hidden in the body's cells. It has also given scientists new knowledge of hormones and certain anti-cancer drugs — thus making possible more effective control of some types of cancer.

Part of the money you donate will support research that may save millions of lives. Won't you give — and give generously — so that sometime in the future doctors may never have to face another patient and say: "I'm afraid it's too late?"

Remember: Cancer can strike anyone, but you can strike back. There's hope — if you give for research and the other vital activities of the American Cancer Society.

HELP SCIENCE HELP YOU

Join the 1950 Crusade of the

American Cancer Society

MAIL YOUR CHECK TODAY TO "CANCER" IN CARE OF YOUR LOCAL POST OFFICE

display was described as being the most comprehensive collection of safety equipment ever assembled at one time.

In the electrical laboratory, an exhibit showed the history of mine lighting and the progress made in the miner's Edison electric cap lamp since it was invented in 1915 by Thomas A. Edison. The present miner's cap lamp, distributed throughout the world by Mine Safety Appliances Company, has 100 times the illuminating intensity of Edison's first model.

A display in the rubber and plastics laboratory covered the development of protective hats and caps made of laminated plastic. The company made the first plastic industrial protective hat approved by the U. S. Navy and Treasury Department. Hats were subjected to a test demonstration in which sharp, pointed missiles were dropped on them.

In the dust laboratory various kinds of dusts were drawn from a sealed chamber through respirators to demonstrate their effectiveness in preventing inhalation of harmful airborne solids by workmen. Dust respirators perfected by the company remove particles as tiny as 1/50,000th of an inch. The company developed the first dust respirator approved by the U. S. Bureau of Mines. Other exhibits in the dust laboratory included equipment for sampling and identifying dust particles, and instruments used in air pollution surveys.

The display in the physiology laboratory consisted of instruments that administer oxygen for inhalational therapy. These are used in treating silicosis and other respiratory ailments, as well as for emergency treatment of drowning and suffocation victims. Another laboratory demonstrated preparation of chemicals used in gas masks and respirators for poisonous or noxious fumes. A breathing apparatus that generates its own oxygen supply, enabling its use in any type of unbreathable atmosphere, also was shown.

Various instruments for detecting poisonous or flammable gases were exhibited. One instrument, a carbon monoxide recorder, can detect as little as four parts of that deadly gas in a million parts of air. This instrument is used for ventilation control systems for vehicular tunnels.

Safety Engineer Supervisor

Desires permanent position as Supervisor with insurance company. 13 years experience in all types of safety in compensation, fleet, fire. 38 years old, married. Member ASSE. Will go anywhere. Excellent record and references. Address Box 78, SAFETY ENGINEERING, 75 Fulton St., New York 7, N. Y.

New Grandstand Code

NEW developments in grandstand construction are recognized in the latest edition of the American Standard for Places of Outdoor Assembly, Grandstands and Tents (Z20.3-1950) just announced by the American Standards Association. This standard adopts, by reference, the latest industry specifications for light-gage steel, for stress-grade lumber, and also permits use of steel pipe and tubular steel members in grandstands. Specifications for two new types of seating arrangements which have come into general use since the last edition are now incorporated into the standard—the foldable-type grandstand, and the trailer-mounted-seating arrangement used by the circus industry.

This standard is a revision and synthesis of two previous American Standards—Portable Steel and Wood Grandstands, Z20.1-1941, and Places of Outdoor Assembly, Grandstands and Tents, Z20.2-1949. Administrative experience in applying the provisions, and recognition of new developments in the field, led to the revision of these two standards.

Who Says That Safety Doesn't Pay?

THE Davison Chemical Corporation received recently the largest returned premium under a workmen's compensation policy which its insurance carriers has ever paid to any company with policies of comparable size. The returned premium was in excess of $30,000. This returned premium was earned by an outstanding record for safety made by the Davison plants located in Maryland, Florida, Georgia, Louisiana, Indiana, and Iowa.

The period covered by the policy was October 8, 1947 to October 8, 1949, when losses paid by the insurance company were only 32 per cent of the premiums paid by Davison. The coverage was of the retrospective type and the amount of the returned premium for these two years had just been calculated when the return was made on June 16, 1950. The coverage is still in force and further returned premiums are very likely to be earned by Davison.

Safety programs have been stressed for several years in all Davison plants. On the date of the returned premium, six of the company's seven plants in the mixed phosphate division had gone a year or more without lost-time accidents. The 1220-employee plant at Curtis Bay, Baltimore, Md., has passed the million-hour mark without lost-time accidents three times in three years. On June 16th, Davison's Bonny Lake Mine (phosphate rock) in Florida reached two years without a lost-time accident, a record which received an award from the U. S. Bureau of Mines.

Active interest and support of the safety programs extend throughout all levels of management and workmen. Frequent safety meetings are held and interest in the program is maintained through monthly reports and continual emphasis in the employee magazines and weekly news letters to plant personnel.

BROUGHT BACK TO LIFE

IMAGINE a club whose membership is limited to those who have apparently risen from the dead. This Lazarus Club now could assemble quite an impressive roster if we include all those who have been pronounced dead by competent medical authorities but have been revived by means of the modern resuscitator.

This startling fact was presented in a dramatic fashion in an article by Robert M. Yoder appearing in a recent issue of "The Saturday Evening Post," copyrighted by Curtis Publishing Company. The author stresses the fact that the modern resuscitator is now one of the nimblest lifesavers of our hazardous times. In its field, it works with a happy efficacy that penicillin and sulfa drugs show against infection and, according to Mr. Yoder, the field of the resuscitator still is wide open.

It is a fortunate circumstance that the author succeeds in enunciating to a wide audience not only the meaning of the word "resuscitator" but its functions as well. He explains in simple language that the resuscitator is an automatic breathing machine of great competence and that its value lies in the fact that it is able to breathe for you in those desperate moments when natural breathing stops. Drowning, according to Mr. Yoder, is the example which comes immediately to mind when the use of a resuscitator is indicated, but there are many other crises far too common for comfort. The device is rendering great service in automobile accidents, and treats imminent death not only from drowning but also from electric shock and from asphyxia from coal gas, carbon monoxide, chlorine, and illuminating gas, or suffocation from many other causes.

The author describes the resuscitator as "a suitcaseful of portable life" as it can be quickly and easily transported from one place to another and has been credited with saving life from Maine to California. Moreover, unlike the "iron lung" with which it has been confused, the resuscitator can be picked up by one man and rushed to the vital scene of the accident.

Its Development

In tracing the development of this resuscitator, the Post article pays proper tribute to its inventor, Dr. George A. Johnstone, a surgeon of Glendale, California. After a long period of testing, Dr. Johnstone and his brother-in-law, C. N. Erickson, a self-trained engineer formed a company in 1928 to manufacture and market the respirators which gained wide acceptance in West Coast hospitals as well as in the Los Angeles Fire Department. Five years later an Erickson and Johnstone salesman, named Phil Stanton, brought the first samples East where the E & J type of Resuscitator met with considerable opposition before it was finally accepted for full approval by the American Medical Association in 1939.

Here is one safety device, the author points out, that almost literally speaks for itself. Failure to apply the mask correctly over the patient's mouth and nose will result in a hissing sound of warning. When all goes well, it signifies that fact by a rhythmic clicking and when the patient starts to breathe for himself, the machine even announces that happy situation. It can then be taken off the job as a resuscitator and used as an inhalator for the application of oxygen and, in addition, where artificial respiration sometimes fails because of an obstruction in the breathing passages, the machine will serve as an aspirator as well.

Most of the resuscitators are made by the E & J Manufacturing Company of Glendale, named for the two inventors and also by the J. H. Emerson Company of Cambridge, Mass. In many of the disasters which made headlines all over the country, notably the La Salle Hotel fire in Chicago, resuscitators were used with marked success.

Mr. Yoder has marshalled his facts and has presented them in a most readable and enlighting manner for the millions of Post readers, and he is to be commended for bringing to the attention of the public at large the safety device which literally has snatched accident victims from the grave. This wide-spread coverage helps to present to the American public the magnificent service being rendered to our citizens by safety equipment manufacturers whose incalculable contribution to human welfare is often unfortunately hidden from the public view. Industry itself is thoroughly aware of this emphasis on safety to life, but when a dramatic article stirs the imagination of the general public it helps to bring about a greater degree of safety consciousness in all walks of life.

KEEP YOUR SAFETY PROGRAM UP TO DATE.

See What's New in Safety

Pages 68–71

Oil Safety Films

THE Department of Safety of the American Petroleum Institute has set up a film library to help the oil industry train its employees and keep them safety-conscious. The library has been started with five 16 millimeter sound-color films. Additional motion pictures may be added later, depending upon the results achieved from the present operation. Each or all of the five motion pictures can be purchased from the Department of Safety at prices far below actual costs to produce such training films. The motion pictures currently in the library were made originally for single company use, but have been re-edited to make them suitable for the entire industry.

Films available, and a brief description of their contents, follow:

For General Meetings:

Minutes That Count—Part I, (30 minutes—$175.00); An interesting and instructive presentation of first aid treatment of arterial bleeding and the dressing of cuts and open wounds. The circulatory system is explained and emphasis is placed upon proper procedures to follow in rendering aid to stop or minimize loss of blood.

Minutes That Count—Part II, (30 minutes—$185.00); This film presents artificial respiration, the handling of dislocations, fractures, infections, and transporting the wounded. By actual demonstration, it shows procedures to follow and necessary precautions in administering first aid.

For Refinery and Gasoline Plant Meetings:

Thermal Forces—(26 minutes—$172.00); A simplified presentation of a problem in physics relating to the effect of heat on water in closed containers. It shows how thermal expansion takes place, and points out the increasing danger of these forces in operating equipment. Animated drawings show the reaction of water being heated in closed vessels and the effect of thermal forces as temperature rises.

For Production Safety and Training Meetings:

Hazardous Helper—(16 minutes—$115.00); An interesting story of the danger of catheads used in drilling operations, and the precautions to be taken to make them a safe helper. An effective presentation designed to encourage safe practices and stimulate interest in the care, maintenance, and operation of this useful yet hazardous drilling rig helper.

More Than Magic—(15 minutes—$120.00); An unusual story treatment in which a parallel is drawn between the acts of a magician and the job of handling tongs, slips and elevators on a drilling rig. Constant flashbacks to the magician provide a comparison that shows how preparedness, skill, caution, alertness and teamwork are essential to the success of any performance.

Gallaway to Head Safety Equipment Asso.

MR. C. H. GALLAWAY, sales manager of the safety division of the American Optical Company, was recently elected president of the Industrial Safety Equipment Association at their annual meeting in White Sulphur Springs, Va. Mr. Gallaway succeeds Mr. L. E. Dickson. Other officers elected were: E. L. Wheeler, of Wheeler Protective Apparel, Inc., Chicago, as vice president; and Stewart N. Clarkson as secretary-treasurer.

For Free!

The Bulletins & Catalogs

Reviewed on Page 67

Are Big Trucks Safe?

(From page 25) which show up in small accidents keeps the driver from establishing bad driving habits that may eventually involve him in a serious accident. Too, every mishap from the broken clearance light and scratched fender on up is counted. And they are included whether they occur on their own private property or on the public streets and highways. The yardstick is the number of accidents to each hundred thousand miles traveled. Thus one accident, whether it be small or large, gives an accident ratio of 1 or one accident per hundred thousand miles.

Safety Records

In considering the size and weight in relation to safety, the records of some fleets of the largest combinations are of interest. The Asbury Transportation Company of Los Angeles operates a large fleet of truck and full trailer tankers. In the 1949 ATA Truck Safety Contest this company had a record of only twenty-two hundredths of an accident per hundred thousand miles of travel in operating 6,355,627 miles.

The Silver Eagle Company of Portland, Oregon, which operates truck and full trailer tanks, had a record in the contest of 19 hundredths accident per hundred thousand miles in operating 3,185,421 miles.

The Coastal Tank Lines, which operates tractor semitrailer units on the highly congested East Coast, had a record of 85 hundredths accident per hundred thousand miles in operating 15,883,594 miles. On the general freight side of the picture, Pierce Auto Freight Lines, which uses trucks and full trailers, operated 2,955,507 miles during the contest year with an accident ratio of .17 or less than two accidents per each million miles. Records such as these set an example for all traffic to follow and cer-

tainly they indicate that in many instances the larger vehicles, many of which are larger than are ever seen in the East, are safer in operation than passenger cars.

Several things go into the operation of trucks and the establishment of safety records. The truck operator will not send a piece of equipment costing from $20,000.00 to $30,000.00 on a run unless it is in safe mechanical condition. Neither will he permit other than a skilled driver to operate such a unit. To do otherwise would be inviting disaster to his business.

Experience in the operation of large vehicles shows that trucks of all sizes have adequate braking power and ability. It shows that adequately powered trucks are available and being used in the organized trucking industry. Experience proves that trucks of all sizes are adequately maneuverable —the largest of them can make a complete turn in a 40 foot radius while the short single unit can turn in a radius as small as 9½ to 11½ feet.

The safety records show that fleets of trucks are operated with such a low accident ratio that they are second to none in the highway safety field. In these records every mishap is counted including the minor ones on private property.

It is readily seen from these safety records, and they are only a few of many, that in the final analysis the size and weight of vehicles have little or nothing to do with safe operation. In every case safe operation depends on well maintained equipment and on trained skilled drivers.

When considered in the light of the knowledge gained from actual operating experience the beliefs that trucks are under-braked, under-powered, unmaneuverable and generally unsafe are dispelled. The beliefs, since they are not based on facts, disappear in the light of reasoning.

In solving our traffic problems the solution is not in trying to find methods of curtailing traffic in any of its forms. The solution lies in finding ways of granting freer movement to all forms of traffic. Experience in the traffic field shows that many of our past methods of attempting to solve the traffic accident problem have been fallacious. We have sought some sort of panacea and there is none. Study based on facts rather than emotions must take place prior to the enactment of future traffic laws and regulations, whether these laws are designed to affect minority groups or the great mass of private motor car owners. In this same matter let me repeat a statement of Mr. Holmes of the Public Roads Administration—"The only measure of the adequacy of a highway location is the facility with which traffic moves over it."

Our traffic problems can only be solved by moving forward—enacting laws and building highways which fit the practical needs—and with the nation's economy always the first consideration.

From an address presented at the 16th Annual Philadelphia Safety Conference.

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Labor-Management Cooperation for Safety

THE Committee on Labor-Management Cooperation for Safety unanimously reaffirms the statement of principles presented to the President's Conference on Industrial Safety in March 1949, which is appended hereto. In its most recent report the fact is recognized that even the best principles are valueless unless applied in practice. The next task, therefore, is to further the acceptance and application of those principles.

The Committee is undertaking to discover and use the most effective means of disseminating this statement of principles to the employers, labor unions and others concerned throughout the country. In this connection they recommend that the Secretary of Labor request the assistance of the Governors of the various States.

The Committee recognizes that an important outlet for the principles is through the States and reports that a number of Governors' Conferences have accepted in toto the statement of principles which the committee enunciated last year. All States are urged to give full consideration to these principles.

The Committee is considering the desirability of having surveys made showing the ways in which the principles are being followed and implemented in practice.

Statement of Principles

1. Safety primarily is the legal and moral obligation of the employer. The employer must have a sincere and continuing interest in providing for the safety of employees. This interest is demonstrated by:

(a) The initiation of a sound safety program with the policies, procedures and staff necessary to make it effective.

(b) The provision of safe working conditions, machinery and equipment and personal safety protective devices and apparel where necessary.

(c) The development of effective training programs for supervisors and employees.

(d) The encouragement of employee interest and participation by making available channels through which employees may offer suggestions, advice and recommendations for the improvement of safety.

Management must have the authority necessary to carry out its responsibility. No steps should be taken which create confusion and uncertainty as to management's responsibility and authority.

2. Cooperation in the safety program is the moral obligation of each individual employee. This is demonstrated by:

(a) Working safely at his job.

(b) Having regard at all times for the safety of fellow employees.

(c) Using his knowledge and influence to prevent accidents.

(d) Calling attention to unsafe conditions.

(e) Contributing his ideas, suggestions and recommendations for the improvement of safety.

3. In unionized plants the welfare of the employees places upon the labor union a moral obligation to cooperate in accident prevention, within the framework of its agreed-upon participation. This is demonstrated by:

(a) Taking its agreed part in the safety program in the plant.

(b) Using its influence in encouraging the employees it represents to work safely.

(c) Promoting accident prevention through its publications, union meetings and educational courses, with emphasis not only upon plant safety but also with due regard to safety in the home, on the highway, and in other activities outside the plant.

Following is a complete roster of the Committee on Labor-Management Cooperation for Safety:

Chairman: Ralph T. Seward, Attorney specializing in Labor Arbitration, Washington, D. C.

Vice Chairman: H. A. Bradley, President, International Chemical Workers Union, AFL, Akron, Ohio

Secretary: Milton M. Olander, Director of Industrial Relations, Owens-Illinois Glass Company, Toledo, Ohio

Membership:

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H. H. Anderson, Vice President and General Manager, Shell Pipe Line Corporation, Houston, Tex.

W. Ellison Chalmers, Acting Director, Institute of Labor and Industrial Relations, University of Illinois, Champaign, Ill.

Fred W. Climer, Vice President in Charge of Employee Relations, The Goodyear Tire and Rubber Company, Akron, O.

Donald Comer, Chairman of the Board, Avondale Mills, Birmingham, Ala.

S. B. Cousins, Vice President and General Manager, New England Telephone and Telegraph Co., Boston, Mass.

Ernest Dale, Lecturer on Labor Relations, Columbia University, New York, N. Y.

Charles Davis, Safety Director, United Mine Workers of America, Washington, D. C.

D. M. Farrell, Assistant Personnel Manager, Safety Training, Shell Pipe Line Corporation, Houston, Tex.

R. H. Ferguson, Manager of Safety, Republic Steel Corporation, Cleveland, Ohio.

Dan Finkle, Textile Workers Union of America, Newark, N. J.

Joseph A. Fisher, President,

Utility Workers Union of America, CIO, Washington, D. C.

J. H. Fitch, Director Personnel, McNeil Machinery and Engineering Company, Akron, Ohio.

Glenn G. Fleming, Chief Safety Engineer, Celanese Corporation of America, New York, N. Y.

Carroll E. French, Director, Industrial Relations Division, National Association of Manufacturers, New York, N. Y.

Glenn L. Gardiner, Vice President, Forstmann Woolen Company, Passaic, N. J.

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Jim Hughes, Commissioner, Department of Labor, Oklahoma City, Okla.

George A. Jacoby, Director of Personnel Services, General Motors Corporation, Detroit, Mich.

Joseph J. Jeffrey, Personnel and Labor Relations Director, Great Lakes Steel Corporation, Detroit, Mich.

Howard J. Jones, Manager, Industrial Relations, Colorado Fuel and Iron Corporation, Buffalo, N. Y.

Thomas Kennedy, Assistant Professor of Industrial Relations, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia, Pa.

Dr. Clark Kerr, Director, Institute of Industrial Relations, University of California, Berkeley, Calif.

E. J. Langland, Great Lakes Steel Corporation, Detroit, Mich.

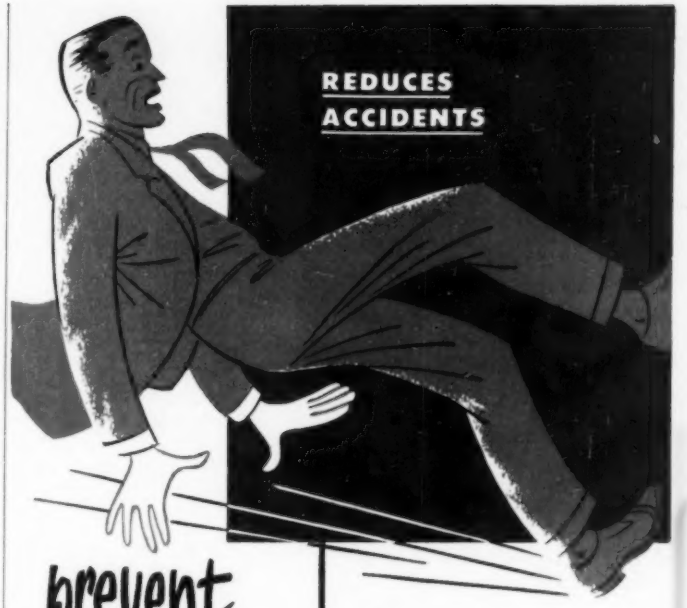
George Q. Lynch, President, Pattern Makers League of North America, Washington, D. C.

Clifford P. McBride, Personnel Manager, Pabst Brewing Company, Milwaukee, Wisc.

David M. Moon, Great Lakes Steel Corporation, Detroit, Mich.

L. C. Morrow, Editor, Factory Management and Maintenance, New York, N. Y.

Herbert Payne, Vice President, Textile Workers Union of America, CIO, New York, N. Y.



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Harry Read, Executive Assistant to the Secretary-Treasurer, Congress of Industrial Organizations, Washington, D. C.

H. J. Spoerer, Director of Industrial Relations, Youngstown Sheet and Tube Company, Youngstown, Ohio.

Anthony Valente, International President, United Textile Workers of America, Washington, D. C.

Fletcher C. Waller, U. S. Atomic Energy Commission, Washington, D. C.

E. J. Wallman, District Safety Supervisor, American Brake Shoe Co., Chicago, Ill.

Leslie Weeden, Vice President in Charge of Manufacturing American Hard Rubber Co., New York, N. Y.

Harold C. Zulauf, Vice President, Alexander Smith & Sons, Carpet Co., Yonkers, N. Y.

Petroleum Safety Record

THE petroleum industry established an all-time safety record in 1949, according to the annual summary of injuries compiled by the Department of Safety of the American Petroleum Institute. The record is even more impressive than it appears because 7,751 more employees were covered in the 1949 report than any previous study. In addition, total exposure exceeded one billion hours.

Best previous safety performance established by the petroleum industry was in 1939. By breaking the 1939 record, the petroleum industry resumed the steady trend toward safer operations which it maintained before the war. During the war years, injury rates increased disproportionately because of the shortage of skilled manpower and the constantly increasing tempo of production and output.

Comparative figures based upon the 1949 API study show that as a result of the petroleum industry's over-all safety program and employee training, the average employee is now three times safer at work than he is in his own home.

The 1949 study resulted from the experience records of 263 oil companies employing 478,583 persons.

The frequency rate of injuries in 1949 dipped to 10.54 per million man-hours worked, and the severity rate of injuries declined to 1.03 days lost per thousand man-hours worked. This represents an improvement of 14 per cent under the 1948 frequency rate, and 11.2 per cent under the 1948 severity rate.

The 1949 study shows that the chances of an employee being injured fatally now are almost 4400 to one, against an average of 2800 to one in 1946. The chances of an employee being disabled by injury now are 45 to one, compared with 34 to one four years ago.

The greatest improvement in safety performance in 1949 was in the drilling department. Here, the frequency rate of injuries showed a decline of 24 per cent below the 1948 totals. Among the safest operations, according to the study, were wholesale marketing and refining.

The oil industry long has been a leader in safety measures to protect its manpower. Oil Company executives were among the first to recognize the need for safety education and training. They drew up codes of safe operating practices, and trained foremen and workers alike in accident prevention and fire protection.

In 1920, the American Petroleum Institute set up a committee to serve as a clearing house for the safety programs of its member companies. Thousands of oil companies were urged to intensify their own programs, and to "pool" their safety knowledge so it could be shared by all members of the industry.

Dividends from Ventilation

(From page 15) see the remarkably large percentage of local exhaust systems which are falling short of their objective because of improper design, maintenance or operation.

Proper design of a process ventilating system involves the following steps, and a mistake in any one will frequently spell failure for the entire installation.

1. The development of a satisfactory hood, the best hood, if possible, but at least a satisfactory one. It is the designer's aim to enclose the source of contamination as much as possible. The required exhaust rate decreases as the percentage enclosure increases. Extra thought and study of the process will be well compensated if it results in more complete enclosure or otherwise reduces the proportion of ineffective air entering the hood. Shaping the hood and appropriate flanging are extremely useful in increasing the proportion of the exhausted air which is effective, that is, which passes through the zone of contaminant release. For example, the quantity rate of exhaust required to capture the dust created in front of an exhaust hood is 40% less with a completely flanged hood than with a hood having no flanges.

2. Calculating or estimating the correct quantity rate of exhaust is sometimes very difficult. Too frequently it is merely guessed at or only the most mediocre calculations are made. Underestimating is serious because it is frequently very difficult to increase the exhaust rate more than a very small amount after installation has been completed. Over-estimating, on the other hand, even as much as 20 or 25% is not of much concern. If the system is carefully designed for this rate of flow, the installation cost will increase only a little and the power consumption will increase by the same percent as the exhaust rate exceeds the minimum required rate. Probably the greatest shortcoming in this respect is not so much one of estimating the wrong rate as it is one of merely guessing at a rate. Low exhaust rates are often due to the fact that the designer does not realize how rapidly the air velocity decreases and the distance from the hood increases. Hoods under suction draw air almost equally from all directions and, therefore, do not have any "reaching out effect" similar to supply outlets or grills.

3. Duct sizing presents no difficulties. The sizes must be calculated, however, not merely guessed at. Improper duct sizes rarely are the basic reason for failure if the system has actually been designed and not simply "thrown in" by a tin knocker.

4. Collectors are the primary reason for system failure as regards control of the dust at its source only if they are undersized. They may then build up excessive resistance to air flow and cause a decrease in the exhaust rate below the required value. This is true only of some types of collectors; others do not have this performance characteristic.

5. Selecting the wrong exhauster is a frequent cause of failure. This

is caused mostly by "guesstimating" the total resistance of the system and sometimes by calculating it inaccurately. It is surprising how frequently no attempt is apparently made to calculate the total pressure head against which the fan must operate, and how frequently the guesses are low. Obviously if an exhauster is selected on the basis of an estimated system resistance which is low, the installation is doomed to failure, which can be corrected only by replacing the exhauster with one of adequate capacity.

Most local exhaust systems which have failed to operate satisfactorily when first installed were not designed carefully. Admittedly some installations will fail even if designed with utmost care for the same reason that certain bridges and buildings fail, but this percentage can be decreased a great deal by actually designing them rather than by installing them on a "rule of thumb" basis.

Operation and Maintenance

Even if properly designed, there is no assurance that the system will operate satisfactorily very long. It is almost unbelievable how many ideas the workers have to "improve" the operation of the system and, only too frequently, how few thoughts the maintenance personnel have of the installation. Changing the blast gates or dampers, partially obstructing the throat of the branch duct, removing end caps, and deforming the hoods are only a few of the numerous methods the workers will think of to "improve" the system. Top-notch maintenance is the best solution to these difficulties. The system must be kept in balance and the exhaust rate must be maintained by routine cleaning of the ducts and collector, and by frequent servicing of the exhauster. Ventilating systems must be given the same attention and consideration as any piece of production equipment, if they are to operate satisfactorily throughout their expected life-cycles. Yet how frequently do we see local exhaust systems so battered, rusted, and aged-looking as to give the appearance of many years of service in the same room with a well kept, successfully-operating piece of production equipment which had seen many years of service even before the local exhaust system had been installed. It simply does not make sense to spend a substantial sum of money on needed air sanitation equipment and then to permit it to become ineffective or even inoperative in a short period of time through lack of adequate maintenance. Poor maintenance is responsible for most failures of systems which were properly designed and installed.

Add to these problems those caused by the department or division head who adds a short branch somewhere along the main or header to control the dust at one more operation, and it becomes apparent that the odds are against a fair return on each dollar invested for

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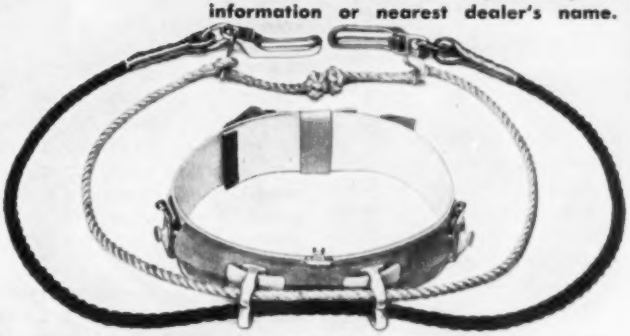

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local exhaust systems. Discouraging though it may appear, a satisfactory solution to this problem is not out of sight. Constant education of the appropriate personnel to appreciate the shortcomings which are robbing them of valuable returns on their money invested in ventilating systems will eventually prevent most of the losses which are only too common today.

Additional Dividends

Experience has demonstrated that most ventilating systems installed for air sanitation, if properly engineered and maintained, pay for themselves and provide a handsome return on the investment in the form of fewer illnesses, decreased labor turnover, and the like. In addition it is not unusual to experience a more direct and wholly unexpected monetary gain from systems provided solely to prevent health or safety hazards or nuisances.

Following are some examples contributed by industrial hygiene engineers from all sections of the country.

1. Several small plating establishments installed exhaust ventilating systems at chrome plating tanks and included collectors for removal of the chromic acid mist or spray. These collectors are recovering sufficient chromic acid to make the installations profitable.

2. In another instance the mist, gas, and steam or humidity from a plating operation which was isolated in a separate building was so bad that the operation was performed by alternate crews of men, the one group resting away from the contaminated air while the other worked. An exhaust system was installed and the working conditions at the operation were so improved that one crew handled the operation without complaint even though considerable manual effort was involved.

3. Because of a continuing bad experience in lead poisoning cases, a small, poorly laid-out brass foundry was renovated and local exhaust ventilation was provided wherever needed to accomplish satisfactory air sanitation. When this foundry was back in operation, management discovered that no new cases of lead poisoning occurred, employee complaints and labor turnover were practically non-existent, and production skyrocketed from the previous value of 70 molds per man per day to 190 molds, while the scrap decreased from a previous value of 10% to a new one of 6%.

4. Instances where the atmospheric dust reduction effected by local exhaust systems, in addition to controlling the health hazard, have decreased machinery maintenance and upkeep costs by as much as 50% are too common to pick out one isolated example for illustration.

5. A final example demonstrates rather forcefully the point of extra dividends. It has to do with shipyard welding during the war. The average total cost of ventilation, including labor and equipment depreciation, was found to be 1.5% of the total welding department payroll. Yet welding superintendents estimated that production, on the basis of pounds of rods used per man, increased by 18 to 29% when good ventilation was provided.

In summary to obtain a good return on ventilation dollars it is necessary to:

1. Select the proper type of ventilating system.

2. Engineer the system carefully (a system worth installing is worth designing in the true sense of the word).

3. Guard against improper operation.

4. Maintain the system in effective operating condition by giving it the same kind of attention as is given to production equipment.

In addition to the adequate dividends provided by effective ventilating systems in the form of decreased illnesses, reduced labor turnover, improved morale and employee-employer relationships, other wholly unexpected gains may be experienced from such systems.

From an address presented at the Seventeenth Annual Greater New York Safety Convention.

Safety Shoe Film A Hit

FIRST publicized about 60 days ago, the sound motion picture "One Ounce of Safety" has met with such enthusiastic response that its producer, Hy-Test Safety Shoe Division of International Shoe Company, has decided to make it available for purchase by prospective users desiring permanent possession for their film libraries.

The primary purpose of the film is to give plant safety directors a forceful "visual tool" that can be used to impress upon workers the importance of wearing protective footwear. Each year there are over 60,000 foot injuries in plants throughout the country. Most of these could be prevented by the wearing of safety shoes.

"Our original intention was to have a number of prints of 'One Ounce of Safety' available for loan on request to our industrial customers," said Norman C. Whitsett, Hy-Test general manager. "However, requests have been so heavy that we find it impossible to fill all of them in a reasonable period of time. To speed up circulation of the film generally and to accommodate promptly companies with large employment and divisional plants requiring weeks and even months of showings, we have decided to make prints of the film available for purchase and permanent possession." The cost will be $47.50 per print. For further details, prospective purchasers should contact their Hy-Test salesman or write Hy-Test Division, International Shoe Co., St. Louis.

Westinghouse Plant Cuts Accidents in Half

THE National Safety Council's "Distinguished Service to Safety Award" was presented to the Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, in recognition of their out-

standing accident prevention work during 1949.

In making the presentation, Mr. George (Mel) Henry, Supervisor of the Massachusetts Safety Council said: "I wish to congratulate and to commend the Westinghouse Electric Corporation, Sturtevant Division, for its outstanding work in industrial safety. The attainment of this national award by your company is indeed a commendable achievement, and it is a pleasure to officiate at such an important occasion."

Receiving the award for the Sturtevant Division was John C. Mansfield, Plant Safety Supervisor, who spearheaded the company's safety effort. Mr. Mansfield attributes the success of the program to the co-operation of all the employees in observing better housekeeping practices, and the consciousness on the part of the safety organization of the human suffering and lost time resulting from accidents. "We placed emphasis on clear aisles, proper lighting, rearrangement of machinery, and proper storage facilities," he said. "It was definitely proven to us that if our plant maintained good housekeeping standards, our accident frequency would come down. Also, our observations show that all accidents are avoidable if proper care is taken."

The Sturtevant Safety Program was guided by Safety Observers from among the workmen who met weekly with their individual group foremen. Safety hazards that had been discovered were reported, and immediate correction was ordered by the responsible General Foreman.

When changes of major nature or of building design were involved, the matter was referred to a Policy Committee of top management members. This group met monthly to dispose of items passed on to them by group meetings.

Augmenting the Safety Committees were statistics kept by Safety Supervisor Mansfield to show where accidents were occurring most frequently; what type of injury was most common; and the cost of industrial accidents. A series of posters, designed to fit the local situation, and accident critiques discussing the cause and cure of recent accidents also were an effective part of the program.

A comparison of 1949 with 1948 showed lost-time accidents were reduced nearly one-half. Hernia cases, a hazard in all heavy industry plants, were practically eliminated in this prize-winning year through proper instructions on how to handle material. Present figures for the first half of 1950 show that Sturtevant personnel are keeping pace with last year's achievement in reducing industrial accidents.

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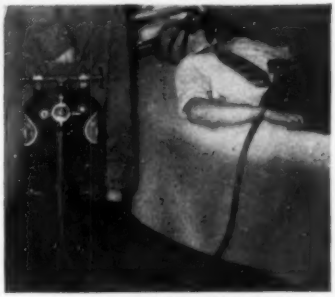

Type "B" DEMAND Inhalator

Protect your safety record with Scott *Demand* Inhalator — the efficient, low-cost way to provide emergency administration of oxygen. Portable and easy to operate, the Scott *Demand* Inhalator can be used by inexperienced personnel, at any location. No adjustments of any kind—no special training needed. Supplies oxygen "as demanded" by patient, or by constant flow. Economical in use — initial cost much less than other equipment of comparable scope.

Type "A" DEMAND Inhalator

Scott DEMAND Oxygen Inhalator is made by the manufacturers of AIR-PAK Safety Breathing Equipment (using air, not oxygen) — the safe, low-cost way to deal with breathing hazards in toxic areas.

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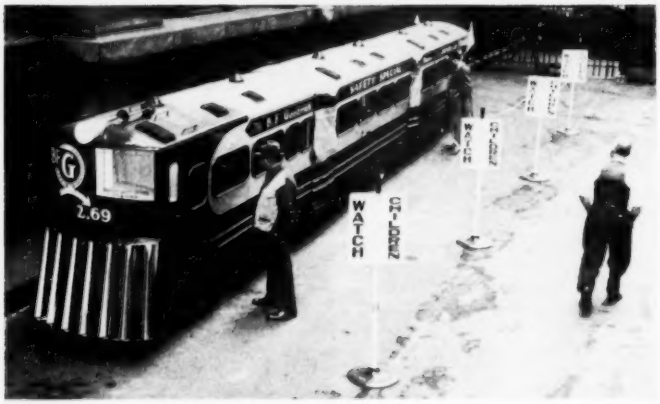
What's New!
in Industrial Safety
See pages 68 - 71

SAFETY ENGINEERING Salutes a Safety Idea for August



The Safety Special

"GET on the safety train" is the current accident prevention message at Akron plants of The B. F. Goodrich Company. As employees step up to view a three-coach, 33-foot long B. F. Goodrich Safety Special Train, a recorded safety message is played from a tape recorder actuated by an electric eye at the "Diesel" cab at the front of the train. A plant tractor tows the train to plant locations.

Twelve safety displays in the windows of the train tell the around-the-clock safety history. One compartment displays a pair of nylon-clad store-display legs with the brief message—"Nice—Wear Your Safety Glasses." Another action display has a chrome-plated axe driven by electric motor, demonstrating that safety-toed shoes will withstand repeated blows from a sharp axe. A counter records the blows.

Traffic safety and home accident prevention emphasize off-the-job safety. Train visitors can pull fire alarm boxes to their heart's content.

The bright red, aluminum-trim train is complete with an observation platform bearing a register for the names of employees and visitors viewing the B. F. Goodrich Safety Special. The roll bears over 5,000 names registering the safety pledge in a fifteen day period. A souvenir ticket resembling a railroad ticket is given to all visitors. The train number—2.69 represents the B. F. Goodrich injury frequency rate for all plants in 1949.

The display was produced as part of the B. F. Goodrich Foremen's Club program which has been successful in reducing disabling injuries by one-half or more for three successive years to the point where the B. F. Goodrich combined frequency—severity rate is the best in the rubber manufacturing industry.

Safety Director, T. J. Cain attributes accident prevention accomplishments in B. F. Goodrich plants to the production employee interest in safety sparked by advertising safety through novel displays, plus letters and telegrams to the homes of all employees encouraging their participation.

In June, 1950, the National Safety Council presented the Distinguished Service to Safety Award to all plants of the B. F. Goodrich Company for outstanding safety performance.

Another novel aspect of the Goodrich safety program is its departmental candy distribution plan. This project consists of distributing each month a bar of candy together with a safety message to every clock-card employee in each department that has been free from disabling injuries during the preceding month. Employees in those departments that have had a disabling injury receive a package of chewing gum with a different safety message. Also inserted in twenty of the candy bars each month are slips entitling each of the twenty winners to a free pair of safety shoes.

When It Pays To Play With Fire

(From page 22) contractors can discover quickly whether they will endanger lives by use of certain materials. Home owners and building owners can veto the use of quick-burning trimmings and decorations. Many manufacturers who have expended much money and effort in developing safer building materials will submit their new products to the Laboratories for test and classification.

Other Testing Equipment

The furnace is merely one of the many ingenious devices especially designed by the Laboratories' technicians to carry out various tests on a wide variety of products. The products tested range from roofing materials to floor wax, and from household fuses to complex machinery.

One tireless machine in the New York Laboratory twists electric iron cords 3000 times to be sure they won't become dangerously worn through ordinary home use. Another pulls electrically-heated blankets back and forth over a framework thousands of times to

make certain that they won't short circuit regardless of how restless the sleeper may be.

Engineers in the laboratory examine such common household articles as the toaster, the fan, the electric wires, and countless other pieces of equipment. They also test floor wax to make certain that it won't be dangerously slippery, and fire extinguishers to make sure they will work efficiently when needed.

Products and materials which pass the tests may then carry the words "Underwriters' Laboratories, Inc. Inspected," or the initials "UL" on the tag or name plate.

Approval Procedures

Any manufacturer can send devices to the Chicago, New York, or San Francisco laboratory for testing. He pays the costs of running the tests on his products, including his share of salaries and overhead. And he pays the same amount whether his product passes the tests or not—the Laboratories have no financial interest in the outcome.

Underwriters' Laboratories, Inc. was started in 1894 and is now a nonprofit, self-supporting organization. It serves as the official testing station for the National Board of Fire Underwriters.

Sometimes manufacturers bring in early designs of a device to discover just what needs to be done to make it safe and to obtain the "UL" listing. Nearly half of all products tested fail to measure up to the high standards the first time. Many of these are then improved by the manufacturer until considered safe by the engineers. More than 375,000 products have been found acceptable for listing.

In the years since its founding more and more people have learned to "look for the Underwriters label."

The new furnace represents one more significant advance in the continuing battle against fire. Scientists in the laboratory are confident that the blaze in the furnace can prevent many future blazes in industrial and public buildings, hotels, and homes.

Pictures by courtesy of Underwriters' Laboratories, Inc.

BE FRESH...
STAY FRESH
wear a DUPOR No. 10
Chemical Cartridge Respirator
Code "A" Cartridges (Soda Lime)—White Plastic for light concentrations of inorganic acid gases.
Code "B" Cartridges (Activated Charcoal)—Black plastic for light concentrations of organic chemical vapors.
Code "AB" Cartridges (Soda Lime and Activated Charcoal)—Yellow plastic for light concentrations of combined inorganic and organic gases.
Sample sent $4.50 pp
Extra Cartridges 70c a set
Unit has DUPOR "controlled-breathing" valves. Double filter apertures hold 50cc. capacity chemical cartridges. Soft rubber face mask gives gas-tight fit on any shape face, as well as panorama view with no blind spots. Chemical filters are packed in colored plastic cartridges that will not corrode like metal ones or crush like paper types. Unit is shipped with code "B" cartridge unless otherwise specified.
For the best in eye protection get H. S. Cover's Gas-Tight, Fog-Proof Goggles.....$1.65
H. S. COVER, South Bend, Ind.

New Quarters for Flex-O-Lite

THE Flex-O-Lite Mfg. Corp., of St. Louis, Mo., is erecting a new manufacturing plant and office building on its recently acquired property in St. Louis County. Total floor area of the installation is 17,500 square feet. Completion is scheduled by October 1, 1950. About 40 persons will be employed. The company manufactures reflective glass beads, widely used for reflectorizing painted highway traffic signs, advertising signs, motion picture screens and airport runway delineators.

Pin-Ups for Mine Roofs

There is room for big machines to move freely when square steel "shin plasters" are used to pin the mine roof to solid rock. By pioneering "pinned-up" roofs in iron ore and coal mines, this U. S. Steel subsidiary has reduced accidents, improved working conditions and raised its product quality.

ANOTHER long step to increase the safety and convenience of underground miners is being taken by a subsidiary of United States Steel. By installing "pinned-up" mine roof supports, Tennessee Coal, Iron & Railroad Company has cleared all upright timber supports from more than 5 million square feet of its coal and iron ore mines.

This means that men who work anywhere in one big new coal mine, in parts of two others, and in seven of eight ore mines of TCI, no longer have to wrestle with big machines and haulage cars in narrow areas between posts erected to support the roof. Their movements are freer than ever before in underground operations of this kind.

The mine roof is literally "pinned" to solid rock above the working areas. As soon as miners have opened a space for working, holes are drilled through the overhead coal or ore and soft slate or shale to hard rock. In the holes, a slotted bolt of strong steel is wedged. The end of the bolt which projects below the roof level is threaded; on it is fastened by means of an ordinary steel nut a large square steel plate which is as effective in holding up the roof as an upright timber.

To date, there have been no accidents from fall of roof in either coal or iron ore mines directly caused by the new method of roof support. In fact, the frequency of accidents in TCI ore mines in 1949 was the lowest in the country's history, in the first eight months standing at 8.32, a reduction of 54 per cent from the same period in 1948.

Meantime, the quality of product has greatly improved. With the advent of the pinned-up roof, slate picked from the mine-run ore has declined from an average of 275 tons a week before the pinned-up roof was introduced, to practically zero. The real "pay-off," according to TCI engineers, has been a reduction of the acid content of conditioned ore by about 2 per cent.

In the ore mines which use the pinned-up roof there has been a distinct reduction in the cost of operation because the steel bolts and "shin plaster" plates are less expensive than big upright timbers. While costs in the coal mines have run a trifle higher, the increased efficiency has more than paid off in all places where mobile equipment is used for loading. Other benefits are improved ventilation due to freer air currents, better clearances hence less damage to equipment, less time required to hang cables, curtains, air lines and the like, as well as better mine "housekeeping."

The initial information which led United States Steel's southern subsidiary to try out this major improvement in mining practice came from the United States Bureau of Mines and the experience of one lead and one coal mine. Early in 1948, TCI engineers began testing the new system in its new Concord mine, which produces some 5,500 tons of coal a day. They soon were adding improvements of their own to the new roof-support system. Studies were made to develop the most economical high-strength bolt and the best method of anchoring it to solid rock, and to determine the best time and places to fasten the plates.

Good rivet-grade steel is used for the bolts. This provides a minimum ultimate strength of 56,000 pounds per square inch, assuring that a 1-inch bolt will support 33,600 pounds of roof on its threaded end and 44,000 pounds on its anchored end. To develop a bolt design that would consistently provide anchorage strength sufficient to develop the full tensile strength of the bolt, tests were made on various designs and sizes of wedges, rods and holes. After installation, the test bolts were pulled by a hydraulic jack rig until they broke and the tensile strengths were noted.

The steel bolts used to support TCI mine roofs are of various lengths, depending on use. The trend in coal mines is to use bolts long enough to penetrate the draw-slate and anchor in the sandstone roof. Practice in the ore mines is to use bolts long enough to anchor the roof in an arch formation, the entire arch anchored to the solid rock above it. In some cases, instead of plates, steel channels are fastened to the pins to hold up larger roof areas where clearance is provided.

Picture by courtesy of Tennessee Coal, Iron & Railroad Co.

Last year, 31,800 Americans were killed in traffic accidents.

Gas Masks and Self - Contained Apparatus

(From page 20) has no mechanical operating components. The two types of cylinder rebreathing units now being manufactured are of one hour or two hour (see Figure 3) duration under hard work. These apparatus function in the same manner so they will be discussed together. The high pressure oxygen from the cylinder is reduced in pressure to a breathing level by means of first, a high pressure reducing and regulating valve, and secondly, an admission valve which delivers the required oxygen flow to the wearer through the breathing bag. The oxygen coming through the admission valve into the bag is delivered by means of a breathing tube to the wearer's lungs through a face covering. The wearer's exhaled breath then passes down another breathing tube into the container holding the carbon-dioxide-removing chemical, then through a cooler, and back into the breathing bag where the purified (carbon dioxide removed) exhalation mixes with the incoming oxygen from the cylinder.

The so-called "lung-governed" principle is one in which the wearer of the apparatus by his own breathing regulates his oxygen supply automatically so as to provide the exact amount required. Some earlier apparatus, particularly those made in Europe, employed a method of fixed dosage in which there was a constant fixed rate of oxygen flow regardless of the rate of work. This meant that the user might have to reduce his work level or risk collapse since no one flow rate is proper for varying work loads.

The rebreathing principle is one which permits an efficient utilization of the oxygen supply. The exhaled breath contains both oxygen and carbon dioxide since the body consumes only a small part of the oxygen which is inhaled. As the user exhales into the chemical container, the carbon dioxide is removed by the chemical and the oxygen which is left is reused. This method of operation applies to all Oxygen Cylinder Rebreathing Type Apparatus as well as the Self-Generating Type. All Oxygen Cylinder Rebreathing Type Apparatus operate in the same manner, but vary in service time depending on the size of the oxygen cylinder and the amount of carbon dioxide removing chemical used. These apparatus require that the oxygen cylinder be refilled and the carbon dioxide removing chemical replaced after each use. As is true of all respiratory protective equipment, training in proper use and maintenance is essential if the most efficient operation is to be obtained.

Demand Type Apparatus

Demand-Type Apparatus all use the same principle of operation, but are available in a number of different models for specific applications.

In order to simplify the discussion of Demand Type Apparatus, the principle of operation common to all types will be discussed first. All of these apparatus consist of a high pressure cylinder of oxygen or air, a demand regulator connected either directly or by a high pressure tube to the cylinder, a facepiece and tube assembly with an exhalation valve and a method of mounting the complete apparatus on the body. In use, the wearer turns on the cylinder valve after putting on the facepiece, inhales, drawing oxygen or air through the demand regulator at breathing pressure to the facepiece, and then exhales through the exhalation valve in the facepiece to the surrounding atmosphere.

The demand regulator which is the heart of the apparatus operates as follows:

The high pressure oxygen or air from the cylinder is introduced into a reducing valve which reduces and regulates the high (about 1,800 pounds) pressure. As the wearer inhales, he creates a negative pressure which draws a diaphragm inward and opens a valve through which the oxygen or air flows to

10 TIMES HIGHER ABRASION RESISTANCE
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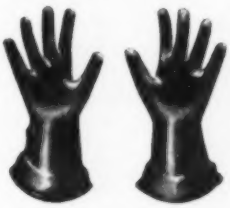
SYNTHETIC RUBBER
industrial gloves



PLUS

Sureseal Synthetic's higher snag and chemical resistance means safer, longer-wearing gloves—*much* lower glove costs.

Standard tests show that Sureseal Gloves are miles ahead on all counts—besides higher abrasion resistance, Sureseal Synthetic Rubber has 4 times higher snag resistance, much higher chemical resistance, than either natural rubber or standard synthetics.

Get more hand protection for less money in your plant—ask your distributor about Surety Sureseal Gloves, or write direct.

THE SURETY RUBBER CO. DEPT. E CARROLLTON, OHIO

In Canada: SAFETY SUPPLY COMPANY, Toronto, Ontario

the facepiece. As the wearer exhales, the valve shuts off, thus producing flow only on inhalation. The term "demand regulator" comes from the fact that the flow is on inhalation demand, automatically regulating itself to the desired level to compensate for variations in breathing needs. All demand regulators should be provided with a by-pass valve to be opened in event of failure of the automatic operation of the regulator. In demand apparatus, the exhaled oxygen is released to the atmosphere instead of being reused.

The Back-Type Apparatus uses a large cylinder of about 40 cubic foot capacity of either oxygen or pure air mounted on a frame held to the body by a harness and lasts for thirty minutes at hard work (see Figure 4). It can be applied generally where complete respiratory protection is desired for a relatively short duration.

The Front and Side Mounted Apparatus use cylinders of either 11 or 22 cubic foot capacity and last about 8 and 15 minutes respectively. For special applications where short service time is all that is necessary such as escape from suddenly developing toxic conditions, these units are useful but must not be regarded as filling the need for a rescue or working apparatus.

Hose Line Demand Equipment

The Work Mask Type of Apparatus (see Figure 5) is used for planned maintenance work. It is not an emergency apparatus as it requires setting up some auxiliary equipment for use and has a connecting hose which limits the free movement of the wearer to the length of the hose. This apparatus is actually a two-fold unit, being a self-contained apparatus with which the wearer can move freely about using a small (11 cubic foot capacity) cylinder to enter or to leave the toxic atmosphere, either routinely or on failure of the main breathing supply. There is a provision for connecting a hose to the demand regulator so that the wearer can breathe during the work period from a large cylinder which has a pressure reducing valve attached to provide low pressure for the connecting hose. This connection with a large cylinder permits working over long periods of time. Manifold assemblies can be provided to permit more than one worker to work from a common breathing source. For safety reasons, the small emergency cylinder should be used with this type of apparatus as otherwise a failure of the supply from the large cylinder would expose the wearer to the toxic atmosphere in which he is working.

Self-Generating Apparatus

The Self-Generating Type Apparatus is made in one model which has been approved by the Bureau of Mines for 45 minute service (see Figure 6). This type of apparatus is a revolutionary departure from conventional apparatus in that it utilizes a chemical canister which evolves oxygen and removes the exhaled carbon dioxide in accordance with breathing requirements. It, thereby, dispenses with high pressure cylinders, regulating valves and other mechanical components and is unique in having no working parts. The canister, which contains a peroxide of alkali metal as the chemical, evolves oxygen when contacted by the moisture and carbon dioxide in the exhaled breath and also retains the carbon dioxide and moisture. The retention of the moisture is important as it permits fog-free lenses.

In use, the Self-Generating Apparatus operates as do other rebreathing units except that the wearer makes his own oxygen instead of drawing from a compressed gas cylinder. The apparatus is efficient in operation and extremely light in weight, weighing less than half as much as Bureau of Mines Approved Demand Apparatus and lasting 50% longer. Perhaps the most salient features of this type of apparatus are its simplicity of construction and use and its almost complete lack of maintenance when contrasted with high pressure apparatus.

As previously pointed out in regard to Gas Masks, the U. S. Bureau of Mines also has an Approval Schedule 13C covering Self-Contained Breathing Apparatus. Except for the special application equipment previously described, all Self-Contained Breathing Apparatus should bear Bureau of Mines Approval. There is definitely an element of proper selection in Self-Contained Breathing Apparatus depending upon the application and service time required, but since complete respiratory protection is provided, the problem of proper protection for a specific hazard is eliminated. The Self-Contained Breathing Apparatus can be used where other forms of respiratory protection would prove

STOP Oily Floor Mishaps
with FULLER'S EARTH
TAMMS
Avoid costly accidents caused by slipping on oily or greasy floors! Reduce fire hazards! Replace sawdust or wood shavings with Fuller's Earth. Every shop and industrial plant where machinery is present needs this low-priced safety aid.
Fuller's Earth absorbs oil and grease — and it's non-inflammable.
Write for FREE SAMPLE to test.
Dept. R.M. 10, TAMMS INDUSTRIES, Inc., 228 N. LaSalle Street, Chicago 1
(FORMERLY TAMMS SILICA COMPANY)

inadequate. While Gas Masks serve a very useful function, their limitations must be recognized if proper protection is to be provided.

Both Gas Masks and Self-Contained Breathing Apparatus can be furnished with a speaking diaphragm in the facepiece as illustrated in Figure 6. The speaking diaphragm provides a means of communication between users of the equipment not possible with ordinary facepieces.

A new type of sound-powered telephone equipment for use with any facepiece equipped with the latest type speaking diaphragm is now available and is shown in operation in Figure 7. This equipment provides communication for long distances over a connecting wire, but requires no power source other than the human voice.

In summary, this brief discussion of Gas Masks and Self-Contained Breathing Apparatus has outlined the major points of design and use, but complete detailed information concerning this equipment is beyond the scope of this article and readers who are interested in gaining further knowledge are referred to the many excellent publications of the U. S. Bureau of Mines and other agencies.

Pictures by courtesy of Mine Safety Appliances Co.

Fire Films

TWO new motion pictures on fire prevention have just been produced by the National Board of Fire Underwriters. One, an 18-minute film of the documentary type entitled, "These Are The Facts" tells graphically of the many public services of the fire insurance business and shows the vital role fire insurance plays in the nation's economy.

The other, entitled, "The Torch," is an unusual fire prevention film, utilizing a new color cartoon technique. Both films will be available in the 16-mm. size for wide distribution throughout the country.

"These Are The Facts" is the first film to deal broadly with the public services rendered to the nation by the fire insurance companies. It shows the inspections of fire departments and cities, the surveys of hospitals and schools, the development of building codes, the research into new fire hazards and the public informational work that is done to prevent fires due to carelessness.

Scenes were filmed in West Palm Beach, Fla., to show the emergency offices set up by fire insurance companies to speed the payment of claims due to hurricane losses, and other scenes were filmed at Underwriters' Laboratories, Inc. in Chicago and New York to show the rigorous testing that stands behind the insurance-sponsored U. L. label.

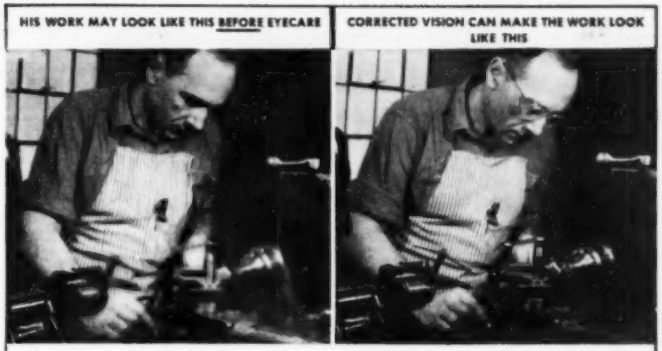
Fire department scenes were filmed in Hartford, Conn., through the cooperation of Fire Chief Henry G. Thomas, and at Red Bank, N. J., with the cooperation of Fire Chief Kenneth Drury.

"The Torch" is a humorous film, showing that there is just a little of human carelessness in everybody, and that this carelessness is responsible for most fires. This carelessness is symbolized by a mythical evil character known as "The Torch." The picture shows that it takes only a little willpower and a little caution to defeat "The Torch."

The semi-animation technique used in the film will make it easily adaptable to television broadcasting. The film will be made available to all stations.

Both films are available for bookings from the National Board of Fire Underwriters free film lending library. This library is maintained at the Bureau of Communications Research, Inc., 13 East 37th Street, New York City, and all requests from East of the Rockies should be sent there.

West of the Rockies, requests should be sent to the National Board of Fire Underwriters, 1014 Merchants Exchange Building, San Francisco 4, Cal.



Visual Care Cuts Accident Costs

Under 20, only 23% of shop employees have defective vision—in the 40 to 50 year group, 71% are affected. AO case histories show (1) accidents and their costs reduced as much as 74% with an adequate EYE CORRECTION-PROTECTION PROGRAM (2) production increases of 1% to 37% and spoilage savings of 11% or better are possible. The complete story is contained in AO's free booklet "IMPROVED INDUSTRIAL VISION." Write Dept. CP-S8.

American Optical Company
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts • Branches in Principal Cities

Chrysler's Safety Plan

A FIVE-YEAR industrial safety record unprecedented for a manufacturer its size has been achieved by the Chrysler Division, Chrysler Corp., under the direction of Oscar F. Lehman, who has been Safety Engineer of the division since the first Chrysler car was built 26 years ago.

Nearly 127 million man-hours were worked at Chrysler Division plants during the last five calendar years with not a single accidental death or permanent disability occurring on the job.

In number and severity, accidents of all types were far below the average for the nation's industries. The frequency rate of accidents for all United States industries during the 1945–1949 period was three times the Chrysler Division rate. The severity rate, as measured by the number of days lost because of injuries on the job, was ten times as great as the Chrysler Division rate.

During the same period, reports of absences caused by off-the-job injuries indicate that the division's workers were far safer while at work than they were at home or on the streets.

David A. Wallace, president of the Chrysler Division attributes this outstanding safety record to a combination of several fundamental factors. First of all, he gives credit to Mr. Lehman for his energy and originality in planning and developing the safety program.

In this, Mr. Lehman has had the full support of Mr. Wallace and A. M. Fleming, vice-president in charge of manufacturing, both of whom believe that in making the factory a safe place to work, they are helping to make it a thoroughly desirable place to work.

A practical and continuous training program in safety, the introduction of all possible mechanical aids to accident prevention, and the elimination of processes that are inherently unsafe or unhealthy have been important contributors to making Mr. Lehman's efforts outstandingly successful.

Mr. Lehman's accomplishments in promoting industrial safety have won him national recognition as a leader in this field. He recently was appointed the sole representative of the Automobile Manufacturers Association on the Safety Code Correlating Committee of the American Standards Association.

This high honor supplements a previous appointment to the President's Conference on Industrial Safety, with which he has served two years. He also is a member of the Governor's Conference on Industrial Safety of the State of Michigan, representing Chrysler Corporation in this activity which is under the Department of Labor and Industry.

Safety Training

The safety training program developed by Mr. Lehman reaches the worker his first day on the job as part of his orientation course. Thereafter, he continues to receive periodic safety instruction from his foreman, who in turn has been intensively trained in safety procedure under a program devised and closely supervised by this resourceful and practical Safety Engineer.

Safety engineers, tool designers and factory layout men have collaborated with Mr. Lehman in reducing the mechanical hazards of manufacturing operations in the Chrysler Division plants.

Machine tools today are provided with everything possible to promote safe operation. If they are not completely fool-proof, they are so equipped with protection against the consequences of foolishness that the chance of injury is greatly reduced. Overhead belts and pulleys, open gears and similiar hazards have disappeared from the Chrysler Division. Moving parts of machines are covered over with guards wherever possible.

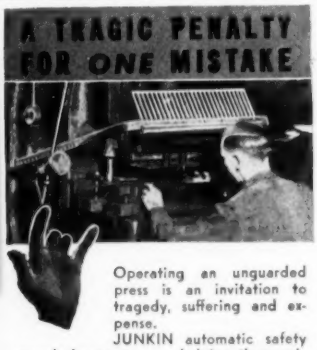
Hygiene Laboratory

Among Mr. Lehman's accomplishments was the establishment of the first industrial hygiene laboratory. This was set up as a means of guarding workers against conditions that would be menacing to health, as distinguished from mechanical accidents.

Among its functions is to determine the concentration of toxic materials, such as dust, gases, vapors, fumes and mist caused by some cleaning, grinding, plating and metal-finishing operations, that a worker could be exposed to safely.

When this concentration is found to be anywhere near the danger point, it either is reduced to a safety level or the worker is equipped with proper personal protective equipment, such as an air helmet, rendering him immune to what otherwise would be a hazard.

In some cases, an operation that was inherently dangerous to men's health was abolished completely.



Operating an unguarded press is an invitation to tragedy, suffering and expense.

JUNKIN automatic safety guards for presses are helping thousands of enthusiastic users set new safety records . . . higher production schedules. JUNKIN guards operate automatically from foot pedal, fall by gravity to bolster plate. Press can't operate until guard is in position.

Write for this New Bulletin

JUNKIN SAFETY APPLIANCE Co., Inc.
930 W. Hill Street
Louisville, Kentucky

JUNKIN SAFETY GUARD

An example was sand-blasting, which under some conditions has a tendency to produce respiratory troubles. This operation long since has disappeared from the Chrysler Division's plants by order of President Wallace. The same manufacturing results now are accomplished by other methods that do not involve the hazards.

The Chrysler Division maintains a well-equipped and well-manned hospital in a recently completed building designed especially to house it. A doctor is on duty throughout the day, as well as a first-aid man. There is also a staff of nurses working in three shifts to cover the entire 24 hours.

Welding Fires

(From page 13) causing substantial damage to the paper machine and hood.

Overconfidence or Recklessness?

Taking a chance with a torch is a poor gamble. An employee was instructed to cut off a duct to an oil-type air filter. Although warned of the danger, he did not think the risk sufficient to warrant use of hack saws and shears. Without shutting down the fan, he used a cutting torch. Sparks immediately ignited the oil. Flames spread throughout the duct, fed by oily deposits, and heat ignited insulation of the steel deck roof above, causing considerable damage.

Contractors Need Supervision

Outside workmen can endanger a plant. A contractor's employee was using a cutting torch while raising a section of corrugated iron, steel-frame roof. A spark lodged in the eave of the roof and fire raced over oily deposits on the underside. Several hose streams were required to put out the fire.

At another plant, contractor's men were welding an outdoor steam line. Sparks dropped through the loose cover of a pipe trench leading to a dry kiln. Sawdust and dry chips ignited, and flames entered the kiln, burning under trucks of lumber, shielded from sprinkler water. Many open sprinklers and hose streams overtaxed the water supply, resulting in a stubborn fire and again in extensive damage.

For Safety's Sake Use

DAYTON SAFETY LADDERS

Maintenance men everywhere rely on Dayton Safety Ladders for maximum safety and convenience. Daytons are constructed of tested airplane spruce and reinforced with rigid steel supports to give great strength and lightness of weight.

Handrails of steel guard the large roomy platform for added safety. Half of platform can be raised to form an extra step, when needed. These famous ladders can be set up instantly, are easy to carry and fold compactly for storing. Automatic locking feature insures safety while ladder is in use.

Write today for Bulletin No. 75

Sizes 3 feet to 16 feet in height with standard rubber safety shoes at no extra cost.

DAYTON SAFETY LADDER CO.
2339 GILBERT AVE. CINCINNATI, OHIO
In Canada—Safety Supply Company—Toronto

Portable Torches Start Fires

During the past seven years, 85 per cent of the fires were caused by portable gas torches, 15 per cent by electric welders.

In 1948, half of the fires occurred during installation, removal, or maintenance of machinery and other equipment. The remaining fires occurred during building construction and alterations, or involved permanently located welding equipment. Only one-tenth were attributed to defective apparatus.

The real danger comes in the use of *portable* equipment. Since this equipment can be readily moved about, it is frequently taken to locations where its use is definitely unsafe, or where extreme precautions are necessary. The pictures accompanying this story show step-by-step the safety measures which should be followed for temporary cutting or welding operations.

Story and pictures by courtesy of the "Factory Mutual Record."

Why Is Safety Good Business?

FORECASTS of eventual savings for employers totalling more than $30,000,000 by 1952 were made today by the Governor's Safety Conference following the announcement of reductions in the Workmen's Compensation insurance rates for the State of Indiana. Commissioner Frank J. Viehmann of the State Insurance Department stated the 13 per cent reduction already earned will amount to savings of $1,950,000 in insurance premiums this year.

Tremendous possibilities for savings through safety in the industrial field are stressed by R. C.

Olson, assistant Labor Commissioner, and co-chairman with Fred Yelton, Safety Director of Delco-Remy, of the Governor's Safety Conference, who reports that 3,971 factory inspections were made during the past year by the State's Division of Labor.

"If this number of inspections can be increased substantially along with an intensive educational program, the time and money spent will be returned many-fold," Mr. Olson declared. "The gratifying progress made so far," Olson said, "can be attributed in part to increased alertness by Labor Unions who are accepting their responsibility in the safety field."

Improved safety reporting procedures and a closer cooperation between management and labor in this all-important work are primary goals of the Governor's Safety Conference which has enlisted the aid of the Indiana State Chamber of Commerce and the Indiana Manufacturers Association in publicizing this broadened program of safety education.

Support by state-wide business organizations and other interested groups is growing as industrial leaders recognize that "Safety is Good Business," officials of the Governor's Safety Conference state in reminding that the savings through the elimination of lost-time accidents are not limited to insurance reductions but must also include improved plant morale, greater efficiency, and the saving of administrative expense in connection with worker injuries.

Material Handling Handbook

A HANDBOOK of Material Handling with Industrial Trucks, a 72-page, practical guide for the analysis of material handling operations and the application of the unit-load method with power-operated industrial trucks and accessories, has just been published by the Electric Industrial Truck Association.

This book, entirely new in text, illustrations, charts and diagrams, together with engineering data, supplants the former Materials-Handling Handbook, also published by EITA, which ran through six editions and which was regarded as the standard authority on material handling practices employing industrial trucks.

Divided into four sections, the Handbook of Material Handling with Industrial Trucks contains: 1) The Evaluation of Industrial Truck Handling; 2) Material Handling Management, with sub-sections devoted to the preparation and use of flow process charts, handling operations in production, handling in storage, the use of unit loads in storage, with layouts, commodity and capacity factors, etc.; 3) The Organization of an Industrial Truck System and, 4) Practical Truck Engineering.

Sections of the book describe the different types of industrial trucks in use; their integration of operation with other material handling systems; unit load determinations and patterns; how to charge and to change storage batteries; how to keep battery records; how to measure handling costs; routing and dispatching methods, and how to train industrial truck operators.

Different types of skids, pallets and other load carriers are illustrated and described, while the book also contains pictures showing actual applications of industrial trucks in handling and storage operations in practically every kind of industry, including automotive, bottling, canning and ceramics down through the metal trades, the paper and printing and the rubber industries.

Single copies of the book are so'd for $1.00, with special quantity prices on application. Executive officials of any industry of business, making application on company letterhead to The Electric Industrial Truck Association, Department PR, 3701 North Broad Street, Philadelphia 40, Pa., will be supplied a copy of the Handbook with the compliments of EITA. This same offer of a courtesy copy is extended to deans and professors of engineering colleges and universities.

Cost of Eye Injuries

"INDUSTRIAL eye injuries in New York cost more than $1,500,000 annually in compensation payments alone—an average of $671 for each compensable eye accident," Dr. Franklin M. Foote, executive director of the National Society for the Prevention of Blindness has announced.

He added that the $1,500,000 bill is only a fraction of the total cost. It covers only compensable eye injuries—ones that keep the worker off the job for more than seven days. Compensable eye injuries represent about one-fourth of all industrial eye accidents in the state, he said.

"Furthermore," Dr. Foote said, "every worker who injures an eye

HORSE SENSE *about* ATHLETE'S FOOT

Bathers like to step on the Onox sponge-rubber mat.

Over 70% of the largest manufacturers in the United States are using Onox in their shower rooms.

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ORIGINATORS OF SKIN-TOUGHENING METHOD OF ATHLETE'S FOOT PREVENTION

—no matter how long he is off the job—costs himself or his employer money in lost production, medical bills, and lost wages above the amount received from compensation. We can only guess at the amount of money eye injuries are costing the citizens of New York each year.

"What makes this needless human suffering and wasted productivity especially tragic is that 90 per cent of those injuries could have been prevented by using proper safety procedures."

Selling Safety

TO CONVINCE the nation's employers of the practical value of accident prevention methods and techniques in factories and industrial plants throughout the country, the safety engineer "must become a top-notch salesman, for the same methods successful in promoting a manufactured product are needed in selling the value of safety," John V. Grimaldi, industrial director of the Association of Casualty and Surety Companies' accident prevention department, told the Virginia State-Wide Safety Conference recently. Mr. Grimaldi pointed out that because safety specialists serve most frequently in a staff or advisory capacity, they must become expert users of the successful sales approach.

"The fact that accident prevention has common-sense values," the industrial director continued, "does not guarantee that it will excite the imagination and control the attention of the boss. It has to be sold vigorously and well. Selling is nothing more than educating a prospect to the advantages of what you have to offer. The first step in every case is to draw the prospect's interest. It is the fundamental for successful selling."

Mr. Grimaldi emphasized that the safety engineer is judged as a capable or poor safety specialist according to his plant's accident experience, and he added:

"It is certainly advantageous to follow up written suggestions for specific safety improvements by discussing these suggestions with your employer. Success in attracting his attention to the importance of the plant safety program will bring about his whole-hearted acceptance of the entire program."

Damaged Floors

(From page 17) for best results, involve accurate measuring and proportioning.

A typical mixture comprises 1 volume of portland cement, 2 volumes of asphalt emulsion (clay type), 3 volumes of well-graded sand and 4 volumes of crushed stone or gravel chips. When the thickness of the surfacing does not permit the use of aggregate coarser than sand, the proportions are 1 cement, 2 asphalt emulsion (clay type) and 4 to 4½ sand. Manufacturers of this type of emulsions provide complete specifications for mixing as well as laying. Slightly different recommendations of proportioning are made for different methods of finishing, such as hand troweling with fibrated emulsion binder, mechanical power floating with nonfibrated emulsion, and also a mixture for fast setting underlayments. It would be desirable for the plant manager, maintenance or safety engineer who is contemplating resurfacing or repairing damaged floors to obtain copies of such specifications.

It must be remembered that cold process asphalt mastic is a complete wearing surface, underlayment or patching material. It presents a non-slip surface wet or dry, but is not comparable to abrasive anti-slip coatings in skid resistance. Under certain conditions, some such coatings may be applied over it if necessary, but for all-around, economical floor service, a properly made, properly laid cold process asphalt mastic has few equals. And smooth floors which are easily trucked over and which provide warm, resilient, non-slippery walking surfaces will be safer.

Fig. 1 by courtesy of Kompolite Co., New York; Figs. 2 & 3 by courtesy of The Flintkote Co.; Fig. 4 by courtesy of Cemasco Floor Co., Chicago; Fig. 5 by courtesy of Florsheim Shoe Co., Chicago.

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5. We place a MAGNIFYING unit on a guarantee of doing the job or being returnable for credit in full.
6. Initial cost of our FIRST AID set up may be as low as $33.15.
7. Special units for building GOOD WILL of workers and (OR) enabling increased output are offered, with privilege of return after 30 days tryout. *Full details promptly supplied.*

Three (3) minutes use of one of our MASSAGE units on a worker's neck should enable the DOUBLING of PRODUCTION.

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Is Industry Safer?

AMERICAN workers were a lot safer in 1949, the National Safety Council reports. Industrial injury rates for last year, released by the Council in advance of the 1950 edition of its annual statistical yearbook, "Accident Facts," show a substantial reduction in both the frequency and severity of 1949 accidents as compared with 1948.

Thirty-eight of the 40 basic industry classifications reduced their frequency rates, and 28 reduced their severity rates. The accident frequency rate for employees in all industries submitting company reports to the Council, based on the number of disabling injuries per 1,000,000 man-hours, was 10.14 in 1949—a reduction of 12 per cent from the year before.

The communications industry again led all other industries by turning in the lowest employee frequency rate. Its rate was 2.14—an 18 per cent reduction from 1948. Aircraft manufacturing again ranked second with 4.25, followed by the electrical equipment industry with 4.83 and steel with 4.96.

Lumbering stayed at the bottom of the frequency list in 1949, with a 47.72 rate, but this represented a 3 per cent reduction. Although coal mining reduced the frequency of its accidents 10 per cent, it could not climb from the next to last position with a 41.48 rate. Mining other than coal was third from the bottom, just below marine transportation.

Severity Rates

The accident severity rate for all industries reporting to the Council, based on the number of days lost per 1,000 man-hours, was 1.02 last year—a reduction of 9 per cent from 1948.

Communications also had the lowest severity rate, leading all other industries with a rate of .15—a 17 per cent drop from 1948. Printing and publishing came up from fourth place in 1948 to tie for second in 1949 with a substantial 47 per cent reduction to give it a rate of .23. The tobacco industry equalled this rate, even though it showed a 21 per cent increase. The service industry was third, with a 63 per cent rate reduction boosting it up from 15th place in 1948.

In terms of severity, coal mining once more stayed at the bottom of the list, with the highest accident severity rate of 6.84. This, however, was a 10 per cent reduction. Mining other than coal achieved a 27 per cent reduction in severity rate to move up a notch ahead of lumbering, which finished next to the bottom with a 4.67 rate.

Mineral Salts To Prevent Athlete's Foot

A COMPARATIVELY new method of preventing athlete's foot has been devised that appears to be right in line with the best medical opinion on the subject. Skin specialists contend that the spores (seeds) of athlete's foot fungi are everywhere—in the air we breathe. They say we can't kill them all and can't avoid exposure to them. Therefore the best method of preventing athlete's foot is to improve the skin's condition and increase its resistance to fungus attack.

This new method of preventing athlete's foot is based on that principle. A solution of mineral salts is used to toughen the skin and make it more resistant to fungus growth. The solution is made available to large numbers of bathers by means of a sponge rubber footmat. When the mat is stepped on, the force-feed action of the sponge rubber squeezes the salt solution up between the toes where it is most needed. The salts adhere to the skin in spite of the drying action of a towel.

The company marketing this product also offers a free educational service, designed to explain the product to employees. This free service is reported to be very effective in obtaining employee cooperation in the use of the product.

Olson Calls for Safety Effort in Indiana

"THE loss of more than three thousand lives from accidents in Indiana during the past year should be enough to shock us all out of our complacency," R. C. Olson, Assistant Commissioner of Labor and co-chairman of the Governor's Safety Conference, told officers of the Industrial Safety Section at the Conference held in Indianapolis recently.

"This loss," the safety leader continued, "is equal to the population of Batesville, Indiana. Certainly if disaster completely wiped out a town of this size in Indiana every year, we would take drastic steps to remedy the situation, but because these deaths have occurred in isolated and often less spectacular circumstances, most of us fail to comprehend the seriousness of these occurrences.

"To launch, through the Governor's Safety Conference scheduled for September 14 and 15 at the Murat Temple in Indianapolis, a campaign for safety in Indiana that will reach every section of the State and that which we hope will reduce our deplorable accident record by 20% by the end of 1951, is your State government's first step in the direction of an overall State-wide Safety Program.

"Closer cooperation by labor and management is needed if they are to do their part in reducing this carnage," according to the speaker and he expressed hope that the Industrial Safety Section, which consists of more than 200 men and women from both labor and management, would develop model safety programs for all industry, with special emphasis on smaller plants.

The Assistant Labor Commissioner and safety leader then cited four glaring weaknesses of our present industrial setup: (1) There are more than 2,000 elevators in the State serviced by a single state elevator inspector"; (2) Indiana has more than 40,000 high and low pressure boilers and only two in-

spectors who are required by law to make two internal inspections per year, which is obviously a physical impossibility; (3) The State has more than 5,000 factories and only 11 factory inspectors, whose rate of pay is exceedingly low and who are changed with each political administration; (4) Several hazardous industries are in need of new safety codes and the Industrial Section should formulate these and present them to the Labor Division's Advisory Council which is an Indiana code-making body with Fred G. Yelton of Anderson as its chairman and consisting of 9 members each from labor and management.

"Correction of these weaknesses," he said "are a few of the many improvements which we hope will stem from the Industrial Safety Section of the Governor's Conference."

"If there is a need for a Boiler and Factory Bureau, a Bureau of Elevator Inspection and a Bureau of Building and Factory Inspection, and I am sure such is the case, let's not make a farce of it. Let's not waste the taxpayer's money by trying to cover this field in a haphazard manner. We are being penny-wise and pound-foolish."

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Awards to General Motors

ACHIEVING the best safety record in its history, General Motors was recently granted the National Safety Council's award of honor for distinguished service to safety.

The accident prevention record of GM employees during the year past was substantially improved over its previous best year from the standpoint of both the number of accidents and their seriousness. It was the sixth time that General Motors has been given an award in this category.

Mr. Harlow H. Curtice, executive vice president, received the certificate of award, along with the official safety award flag of the council, which bears five stars now, one having been added for each year of the award following the original citation in 1942. The award was made to General Motors heretofore in 1942, 1943, 1944, 1947 and 1948.

The company-wide accident rate (number of accidents per million man hours worked) for General Motors in 1949 was 2.57, an improvement of 19 per cent over the 1948 record. Under regulations of the American Standards Association, this is the lowest rate ever achieved by GM employees. The same is true for the 1949 severity rate (number of days lost per thousand hours worked), which was .428, representing a 22 per cent improvement over 1948.

In accepting the award on behalf of all GM employees, Mr. Curtice said:

"The splendid safety record achieved in 1949 is a great tribute to the cooperative efforts of GM employees and the members of supervision who guide them in applying safe working habits in their daily jobs. Without the real interest of everyone in our organization, we would not have had such outstanding success with our safety program last year. It is especially gratifying that we were able to make this fine record at a time when our peacetime production was geared to an all-time high, with many new employees who required training in safe working practices."

Dry Ice Helps Oil Drillers

DRY ice was put to work recently to solve a critical problem at an off-shore oil well in the Gulf of Mexico. Oil and gas pressure threatened to blow out the drill pipe and endanger personnel and adjoining wells. Quick-thinking drillers pumped mud into the drill pipe and surrounded it with pulverized dry ice. The resulting plug of frozen mud held the pressure in check until controlling valves could be put in place.

Elevator Safety

ADDRESSING a meeting of the Safety Engineering Club of Baltimore, George H. Reppert, of the Engineering Department of the Otis Elevator Company and one of the country's leading authorities on elevator safety codes, declared that safe elevator operation depends primarily on correctly designed and installed equipment with adequate safety devices, proper maintenance and periodic inspection and testing by qualified personnel.

Mr. Reppert, who is Chairman of the Central Code Committee of the National Elevator Manufacturing Industry, Inc., in which capacity he is in charge of industry-wide, national elevator safety activity covering the installation, inspection and maintenance of elevators of all types, spoke on the subject, "Cause and Prevention of Accidents on Passenger and Freight Elevators."

Passenger elevators in the United States carry almost 18 billion passengers each year and travel more than 241 million passenger miles, Mr. Reppert said. He reported that 86% of all passenger and freight elevator accidents occur at or adjacent to hoistways and at car entrances during the interval when passengers are getting on or off elevators.

"It is evident that the installation of adequate protective equipment, such as substantial landing doors or gates and their locking devices and car doors or gates with electric contacts conforming to modern elevator safety regulations, will reduce the number of accidents to a very large extent," Mr. Reppert declared. "In most cases this protective equipment can be installed for a reasonable cost and with little if any alterations to the building."

Mr. Reppert pointed out that Baltimore was one of the first cities to formulate a comprehensive elevator safety code. The local code was adopted in 1922 and was revised along with the Building Code in 1941.

Only by adopting and enforcing adequate elevator safety standards or codes can the installation of safe elevator equipment be secured, Mr. Reppert said. Among the 31,000 elevators of all types in operation in the Borough of Manhattan in New York, a survey showed that more than 31% of the total accidents occurred on elevators that had been installed before 1931 when the present comprehensive New York safety code was adopted, as compared to slightly more than 3% of accidents on elevators installed after 1931.

Safe elevator operation requires that frequent inspection be made by trained personnel employed by building owners or tenants to supplement the periodic inspections conducted by city, state and insurance inspectors, Mr. Reppert said. Hoisting and drum counterweight ropes and slack cable switches should be tested frequently, and a thorough inspection of the speed governor and car safety parts should be made at least once each year. Special attention should be paid to proper maintenance of car guide safety shoes, car guide rails, sheave grooves and lubrication of wire hoisting ropes.

In conclusion, Mr. Reppert recommended that the safety equipment provided on individual elevators be compared with the equipment required by the American Standard Elevator Code and that any deviations be corrected by installing adequate safety devices of an approved type.

New Code for Linemen

FOUR new specifications for rubber protective equipment used by electrical linemen have been approved as American Standards. These cover: insulator hoods, blankets, sleeves, and line hose.

These standards were developed by a committee of 15 national organizations sponsored by the American Society for Testing Materials and the Edison Electric Institute under the procedures of the American Standards Association.

The fact that rubber and compounding materials of prewar high quality are again available brought about the preparation of this new standard which replaces a 1945 wartime edition.

One of the principal changes is an increase in tensile strength. For both insulating hoods and line hose the minimum limit for tensile strength has been increased from 1200 psi to 1600 psi; for insulating blankets from 1400 psi to 2500 psi, while for the insulating sleeves the increase is from 1800 psi to 2500 psi. Correspondingly, the elongation and set have both been changed in the new edition. For example, in the case of the line hose and insulator hoods the elongation at rupture has been changed from not less than 400 percent in 2 in. at rupture (2 in. stretched to 10 in.) to not less than 350 percent in 2 in. at rupture (2 in. stretched to 9 in.) while the set in 2 in. following an elongation of 150 percent (2 in. stretched to 5 in.) has been changed from a maximum of 0.5 in. to 0.25 in. ($\frac{1}{4}$ in.).

The wartime specifications contained the safe working voltage (volt rating) as part of the title of each standard. However, as the safe working voltage varies under different climatic conditions it was decided to replace the "volt rating" with the phrase "Proof test 10,000 volts, 3 minutes," for example, to indicate that this is the test voltage under laboratory conditions.

Wherever possible, the standards now permit the use of water electrodes for making dielectric tests on rubber protective equipment as well as previously specified metal electrodes.

Copies of the following specifications compiled in one volume may be obtained from the American Standards Association, 70 East 45 Street, or from the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pa., at 50 cents per copy: American Standard Specifications for Rubber In-

sulating Line Hose, J6.1-1950; American Standard Specifications for Rubber Insulator Hoods, J6.2-1950; American Standard Rubber Insulating Blankets (Without Fabric Reinforcement), J6.4-1950; and American Standard Specifications for Rubber Insulating Sleeves, J6.5-1950.

Painting Concrete Floors

CONCRETE floors, either exterior porch or interior utility room, should be acid etched prior to painting, according to paint experts of the Pittsburgh Plate Glass Company. By etching, the adhesion of paint coats is greatly improved and alkalies, which have a destructive action on paint films, are neutralized to a great extent. A solution of muriatic acid with three parts of water should be mixed in a wooden or enamel pail. Apply one gallon of the solution to 100 square feet of floor area and scrub well with a stiff fibre brush while applying. Allow the solution to remain on the floor until it stops bubbling; then flush off thoroughly with clean water. If surface does not dry in a few hours it should be flushed again. It is then ready for painting.

Mechanization Is Safer

SOME telling points on the safety value of mechanization were made by Mr. Sears L. Hallett when he spoke on "The Relations of Mechanization to Safety" at the Safety Engineering meeting of the Boston Chapter of the ASSE, held in conjunction with the Annual Massachusetts Safety Conference. Mr. Hallett pointed out that 22% of all disabilities were caused by handling objects, 10% of all permanent disabilities and 26% of all temporary disabilities were from the same cause.

The methods of handling are: a. manual lifting, pulling and pushing, and b. mechanized moving by means of conveyors, hoists, cranes, industrial trucks, tractors, and 2- and 4-wheel trucks.

In manual handling, weight is the controlling factor, and accidents resulting from manual handling include strains, sprains, hernias, crushed fingers and toes, and broken limbs. In mechanized handling, the mechanical equipment eliminates the weight factor, with the result that ramming and falling objects constitute the principal hazard.

The causes of materials handling accidents were listed by Mr. Hallett in the order of their importance as: overtaxing individual capacity, lack of lifting equipment, improper lifting practice, physical predisposition, poor housekeeping and joint lifting. The obvious cures, point for point, are: 1. provide mechanical means so that it is impossible for the worker to overtax himself, 2. provide lifting equipment, 3. train workers to correct lifting practice, or provide machine to eliminate the need for this training, 4. do not let workers who show predisposition for accidents perform handling jobs with or without mechanical aids, 5. provide mechanical means to eliminate housekeeping difficulties and to make this job as easy as possible, 6. operate under the rule that if an object is too big to be lifted by one man alone, it is too heavy to be lifted manually—instead provide a machine to do the job, and 7. mechanized handling reduces the number of men involved, thus providing less exposure to accidents.

To prove the safety value of mechanization, Hallett explained that the average reduction in the number of accidents is 28.2% following mechanization. Listed by industries: steel—20%, food—20%, textiles—21.7%, automotive and aircraft—33.2%, paper—76.7%, lumber—16.7%, fuel—10%, electrical—26%, chemical—40%, and merchandising—17.3%.

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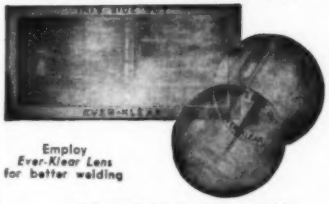

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Twenty-third Annual Maine State Safety Conference, Sept. 14–15. (Marshall House). A. F. Minchin, director, Industrial Safety Division, Dept. of Labor & Industry, Augusta, Me.

Cleveland, Ohio

Twelfth Annual Ohio State Safety Conference, Sept. 19–20. (Hotel Carter). Carl L. Smith, secretary, 2073 E. 9th St., Cleveland 15, Ohio.

Chicago, Ill.

Thirty-eighth Annual National Safety Congress and Exposition, October 16–20. (Stevens Hotel). R. L. Forney, general secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Philadelphia, Pa.

Seventeenth Annual Philadelphia Regional Safety Conference and Exhibit, February 6–7, 1951. (Bellevue-Stratford Hotel) Walter Mathews, manager, Philadelphia Safety Council, 17th & Sansom Sts., Philadelphia 3, Pa.

New York, N. Y.

Twenty-first Annual Safety Convention and Exposition, April 3–6. (Statler Hotel) John Cost, general chairman, Greater New York Safety Council, 60 E. 42nd St., New York, N. Y.

Chicago, Ill.

Twenty-eighth Annual Midwest Safety Conference and Exhibition, April 24–26. (Congress Hotel) Joseph F. Steeh, manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2, Ill.

Pittsburgh, Pa.

Twenty-sixth Annual Western Pennsylvania Safety Conference and Exhibit, April 24–26. (Hotel William Penn). Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, Inc., 605 Park Bldg., Pittsburgh, Pa.

Chicago, Ill.

Fourth National Materials Handling Exposition, April 30–May 4. (International Amphitheatre). Clapp & Poliak, Inc., exposition management, 341 Madison Ave., New York, N. Y.

Electric Arc Welding

IN AN attempt to reduce the number of potential hazards in electric arc welding—one of modern industry's most versatile techniques—a new bulletin has just been published by the accident prevention department of the Association of Casualty and Surety Companies.

Because of its economy and flexibility, welding has, in many cases, taken the place of riveting, bolting and other forms of fastening metals together in the construction of aircraft, automobiles, trucks, ships, railroad cars, refrigerators, buildings, bridges and many types of tools and machinery.

"As with a number of other occupations," the introduction to the bulletin says, "there are certain inherent hazards encountered in electric arc welding which must be recognized and approached from the viewpoint of the casualty insurer. However, if proper recognition is given to these hazards and suitable protection taken, the process is normally safe and the frequency of accidents and losses is no greater than with any other manufacturing process."

Some of the principal hazards referred to in the bulletin include electric shock, flying sparks, and the possibility of inhalation of fumes containing harmful gases. Copies of the newly-published bulletin are available through member companies of the Association.

Testing By National Bureau of Standards

THE National Bureau of Standards receives many inquiries from industry and other sources regarding the scope of its testing program, the type of tests it makes and the fees it charges for this service. A new circular, *Testing by the National Bureau of Standards*, has just been published which fully describes the Bureau's test policy, presents general information on testing, and lists fees for most of the test work that is done. This circular is now available from the U. S. Government Printing Office.

The Bureau's testing and calibration activities stem from its custody of the Nation's basic physical standards. Accuracy and uniformity in measurements throughout the United States depend on these standards, and Congress has therefore authorized the Bureau to engage in testing work for the Nation in those cases where devices or materials must be checked with the Bureau's standards or where sufficient accuracy cannot be obtained elsewhere. The National Bureau of Standards does not compete with qualified commercial testing laboratories, nor does it have the authorization, funds, or facilities to do general testing for the public. Fees listed include those for tests on electrical standards and instruments; standards of length, mass and time; pyrometers; fuels; radio-

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active standards; mechanical instruments; and optical instruments.

National Bureau of Standards Circular C483, 93 pages, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 25 cents a copy. Remittances from foreign countries should be in United States exchange and should include an additional sum of one-third the publication price to cover the cost of mailing.

Four Foundries Have Perfect Record

IMPRESSIVE gains in steel foundry safety practice during the last year, highlighted by achievement of perfect safety records by four steel casting companies and exceptionally low accident frequency ratings by 12 others, was reported by F. Kermit Donaldson, executive vice president, Steel Founders' Society of America.

Heading the list of companies cited by the national technical society was Hughes Tool Company, Houston, Tex., which maintained a perfect safety record for the second consecutive year with no lost-time accidents of any sort throughout 1949 and 1948. The three other companies with unblemished records in 1949 were Calumet Steel Castings Corp., Hammond, Ind.; Gunite Foundries Corp., Rockford, Ill.; and Skagit Steel & Iron Works, Sedro-Woolley, Wash.

Closely trailing these four safety leaders, 12 other steel foundries established exceptionally low lost-time accident frequency ratings of less than 10.0 (per 1000 man-hours of exposure), and an actual average rating of only 6.0. Seven of these same 12 honor winners, Mr. Donaldson reported, established two-year records, having maintained similarly low ratings through 1948.

Cut Out the Noise

AS PART of its over-all safety and health program for employees, the National Refining Company, Findlay, Ohio, safeguards the hearing of those employees working in areas subject to unavoidable industrial noise by supplying them with anti-noise ear stopples. Boilermakers and workers in the tank car repair departments find ear stopples of value in the prevention of nervous tension and loss of efficiency usually resulting from continuous exposure to noise.

The ear stopples used are small, pliable balls of wax and cotton that are easily molded to seal the ear completely and reduce surrounding noise levels at least 40 per cent. Hygienically prepared, they are non-irritating, comfortable to wear and instantly removable. Their cost is nominal for they are designed industrially as disposable health aids, like paper drinking cups.

industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Atomic Energy Commission Starts Fellowship in Industrial Medicine

A FELLOWSHIP program for training a limited number of industrial physicians will be started by the Atomic Energy Commission this fall, if qualified candidates can be obtained.

During the 1950–51 academic year up to four qualified candidates will be selected for academic training in industrial medicine. The stipend for Fellows will be $3,600.

During 1951–52 an additional year of on-the-job training at AEC installations will be offered to selected physicians who complete the first year of academic training. On-the-job training would carry a salary of $5,000 per year.

The need for qualified industrial physicians throughout atomic energy installations is critical, and at the end of the two-year training period Fellows may find employment in the program. However, there will be no commitment on the part of the AEC either to continue the applicant's training beyond the Fellowship year, or to provide the applicant with employment upon completing training. On the other hand, the applicant assumes no obligation to take the on-the-job year of training or to seek employment with the AEC or its contractors.

All candidates will be required to have a full security investigation and clearance before being appointed.

Two of the Fellows selected this year will be sent to the School of Medicine, University of Rochester, Rochester, N. Y., and two will enter the Department of Occupational Medicine, School of Public Health, University of Pittsburgh.

Selection of candidates for the first-year Fellowships will be made by a selection committee, under the chairmanship of Dr. James H. Sterner, consultant to the Division of Biology and Medicine, AEC. Prospective applicants should have completed a medical course and a satisfactory internship, plus one year of residency in internal medicine or its equivalent.

Application forms for AEC Industrial Medicine Fellowships may be obtained from the AEC Industrial Medicine Fellowship Committee, Division of Biology and Medicine, Atomic Energy Commission, Washington 25, D. C.

Plumbing Problems Course

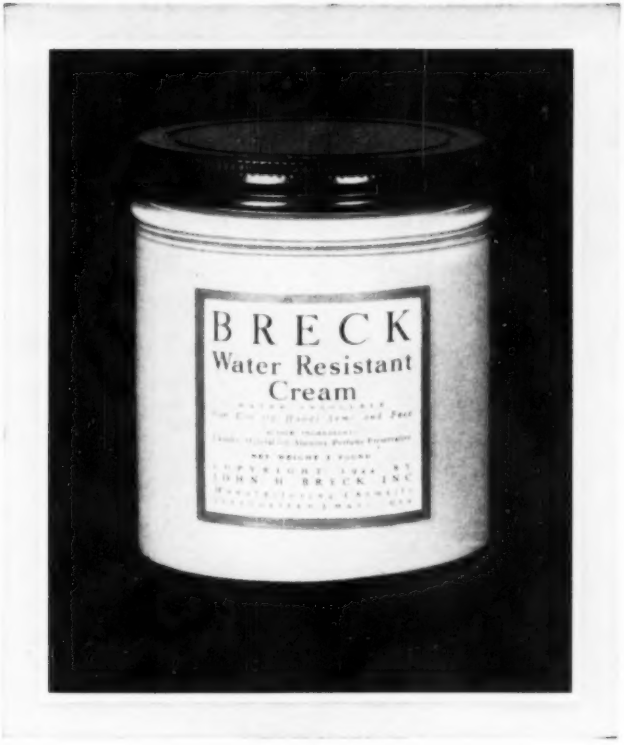
THE University of Michigan's School of Public Health is offering an inservice training course in plumbing problems on September 15–16 in Ann Arbor, Michigan. Persons enrolling and completing the course will receive an official "Record of Attendance."

This is the second such course given in the field of plumbing problems. It is planned to develop some of the fundamental considerations involved in the more established practices, as well as in newer problems that assume significance in plumbing practice. The course is given at the request of the Plumbing Inspector's Association of Michigan.

Plumbing inspectors, practicing plumbers and local health department officials have helped to develop the program. The general outline of the course includes the following subjects: 1. Hydraulic principles used by the plumber, 2. Safety precautions and safety devices, 3. Protective equipment for water supply systems, 4. Plumbing problems involved in the disposal of trade wastes, 5. Fundamentals governing septic tank design and installation, 6. A national uniform plumbing code.

Applications for enrollment in the course, the enrollment fee is $5.00, should be submitted to H. E. Miller, School of Public Health, University of Michigan, Ann Arbor, Mich.

Free Bulletins & Catalogs Are Reviewed on Page 67



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Other Breck Industrial Preparations are Breck Hand Cleaner, a mild non-alkali skin cleanser, and Breck pH7 Protective Cream, for protecting skin from grease, paint, and similar substances that are apt to become embedded in the skin.

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LEARNING THE

POOR SIGNALS CAUSE DEATH

A LOOM in the workroom of a cottonmill had been stopped while an overlooker made some adjustments to a spring. A worker, seeing the overlooker start the machine and walk away from it, assumed that he had finished the adjustments. Five minutes later the machine stopped and the worker, thinking it was a technical stoppage, switched on again. As the machine started it bumped against something and the employee switched off immediately. The overlooker, at the far end of the loom, shook his head, on which there was a blue mark over the left temple. Stating that he was all right, he continued his work before going to the first aid room for treatment. His head had been caught between the loom sleigh and the balance wheel, a fatal injury causing death.

At the inquest it was mentioned that the method of showing that a loom was being repaired was to remove a shuttle and place it on the machine. It was also the practice of an overlooker to start a loom and leave it running for the weaver after repairs had been carried out. The events leading up to this accident show the shortcomings of the system of notifying the operator that the loom was ready for use. The overlooker should have been the only person able to put the machine back into service, and temporary warning tags should have been put on the machine.

THE PAIN OF GLASS

AN ELECTRICIAN took the wrapping from a coil of wire to a garbage can to dispose of it. Pushing the paper down in the can, he cut his hand on a broken light bulb which had been thrown into the can. Three sutures were necessary to close the wound. The light bulb should have been placed in a can marked "FOR BROKEN GLASS ONLY."

SAFE DUCTS SAVE LOSS

PAPER passing through a printing and glueing machine at a food container plant broke under tension and was ignited by a gas burner flame before interlocks could shut off the gas or stop the machine. A large fan drew fire into the exhaust duct system which also served three other machines. The aluminum ductwork had no clean-out openings and contained heavy glue deposits; heat melted most of the ductwork and opened ten sprinklers in the room. Production was interrupted for several shifts. Ductwork subject to combustible deposits should be constructed of heavy-gage metal, with sufficient removable panels to insure adequate inspection, cleaning, and fire fighting. It is preferable to use a number of small duct systems rather than a single large system.

HARD WAY

STATIC CAUSES FIRE

IN THE manufacture of air-foam pillows, a Midwestern rubber plant had been using latex as an adhesive in joining two cushion halves. It was replaced with gasoline-thinned cement, but no special precautions were taken against fire. Just a week later, a static spark ignited vapors, and fire flashed over the freshly-cemented stock. Fortunately a sprinkler controlled the fire while employees used extinguishers. Whenever flammable liquids are introduced, the possibility of static sparks must be eliminated, and other standard precautions taken. The plant resumed the use of latex, which has no flammable-liquid hazard.

FLAMMABLE VAPORS IGNITE

AT A pipe painting process plant, vapors from xylol used as a thinner collected at floor level and were ignited by sparks from an open, direct current motor. Flames spread to a drip pan and quickly involved the entire machine. Water-spray nozzles, foam, carbon dioxide and dry chemical units were used in putting out the fire. Electrical controls on the machine were seriously damaged. Electrical equipment which can cause sparks is highly dangerous wherever flammable vapors are present. At this plant the open motors at all painting machines are being replaced with enclosed motors of a type approved for such locations.

REFRIGERATOR EXPLODES VAPORS

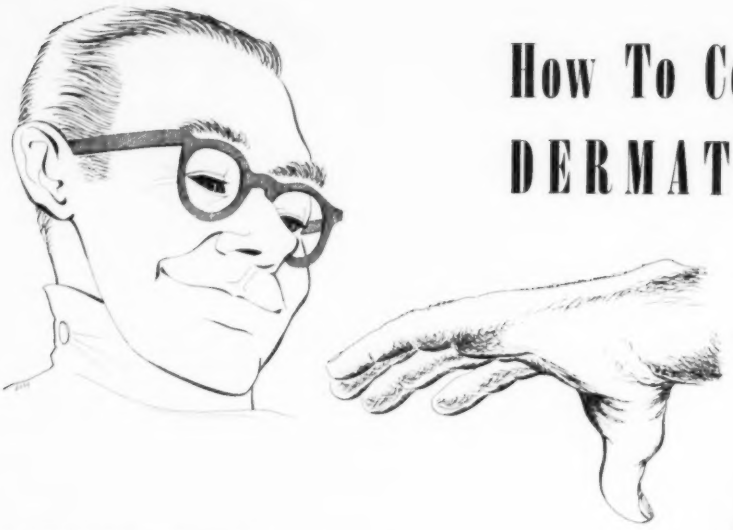
THE engineer on night duty in a Northern hospital heard an explosion. Investigating he found a refrigerator in a nurses training laboratory blown apart, a laboratory table damaged, and glassware broken. Fire was burning in the wreckage, but he and others put it out with extinguishers. A spark from the refrigerator's thermostatic control had ignited flammable vapors from a leaking or uncovered container—a not uncommon occurrence in laboratories. Care is needed to see that materials releasing flammable vapors be kept in safe containers.

THE BROKEN RECORD

THE blast furnace department of a Northern steel company operated 542 days or approximately 800,000 man hours up to March 24, 1950 without a lost-time accident. On that date, an employee of 39 years' service attempted to stop a crane bucket from swinging by holding onto the edge of it with his hand. The crane operator, unaware of this, opened the jaws of the bucket, and the man sustained a severe laceration of the tip of the middle finger of the right hand.

This man was experienced and knew that a bar should have been used in guiding or attempting to stop a crane bucket from swinging, but it is possibly the old story of familiarity breeding contempt and a good safety record was shot on that date.

How To Control DERMATITIS



FEATURE

This is the third of three feature articles on Skin Protection. The first two articles, dealing with Soaps and Protective Creams, appeared respectively in the June and July issues of SAFETY ENGINEERING.

By WILLIAM S. JOHNSON,
Industrial Hygienist, Bethlehem Steel Company, Bethlehem, Pennsylvania

What measures can be used to protect personnel?
Why is dermatitis control a responsibility of the hygienist?
How can occupational dermatitis be discovered early?

SINCE occupational dermatitis comprises at least two-thirds of all reported occupational diseases,[1] the control of dermatitis in industry becomes an important problem, both economically and medically. Control of this problem is a joint responsibility of the industrial physician and the industrial hygienist. The physician can diagnose the condition and treat the patient, but he needs the help of the industrial hygienist to adequately institute an effective control program.

A careful preplacement examination, including a searching history for skin disorders, should be made. It has been said that placement of such employees is a personnel department problem. It is much more a medical department problem, for without sufficient direction from the medical department, the personnel officers may easily go astray in the placement of prospective employees, to the later discomfort of both the employee and the medical department. We know by experience that certain types of individuals are more prone to develop dermatitis when exposed to irritants. Among these people are those with fair skin or dry skin, those with a history of previous dermatitis of any kind, and those with allergies.

Protective Creams

After proper selection, prevention is of next importance. The best program does not depend on selection alone. The instruction of the new employee in the existence of a hazard and *why* it is necessary to use protective measures and hygiene, the issuance of protective creams, protective clothing, proper cleansing after work, use of proper soaps, and periodic inspection of wash rooms and their facilities are all of major importance in the design of a control program.

There are today a number of reliable manufacturers of protective creams, providing a selection of creams designed to do specific jobs of protection. These creams should be strictly controlled by the Medical Department, preferably by its industrial hygiene section, for here is the combined knowledge of the type of exposure and of the cream designed to protect against that particular exposure. The issuance of creams should be made from the Medical Department and nursing personnel should be instructed to issue creams only as prescribed.

Importance of Soaps

The removal of skin sensitizers or irritants from the skin is a very important factor in the prevention of occupational dermatitis. The agents used for their removal play an essential part in that prevention. It has been said that the most effective action produced by a protective cream is the necessity for its removal by soap and water. This statement is not without

merit. Soaps of too great alkalinity, or containing too harsh an abrasive can cause a dermatitis of themselves. Careful selection of industrial hand cleansers will pay unusual dividends. Much is to be said for the comparatively new sulfanated oils as a substitute for industrial powdered soaps. This type of soap is especially effective where the skin requires thorough cleansing. The wetting action of the sulfanated oils renders them able to reach deeper into the skin and remove imbedded dirt. As an illustration—an outbreak of dermatitis from fiber glass, due to the abrasive action of small particles imbedded in the skin, was completely cleaned up in a few days by the use of a sulfanated oil cleanser in the soap dispensers of the wash rooms.

Value of Inspections

In large industrial establishments where janitorial services are provided in each locker and wash room, there is very often a tendency for the janitor to substitute the most available cleaner in the soap dispensers when the regular supply is exhausted. When this cleaner happens to be a floor cleaning agent or a scouring powder, the results are often drastic. This emphasizes the necessity for the industrial hygienist to make it his responsibility to periodically check all sanitary facilities, not only soap and towel supply, but also the availability of hot water and cleanliness in general. The time and effort for such inspections will be returned fourfold in lessening the trouble caused by improper soaps, lack of towels and hot water, and in increasing the general sanitary tone of the wash rooms.

Another type of inspection which will point out the reason for undue incidence of dermatitis is a "gate-check." If the industrial physician and the industrial hygienist will place themselves at an exit gate of the plant and examine the hands and arms of homeward bound employees, the percentage of unwashed persons observed will often be surprising. Such a method is effective in pointing out offending departments or individuals and often shows why an increased incidence of dermatitis has been experienced.

The prevention of occupational dermatitis depends also upon prevention of contact with the offending agent. The use of protective clothing is mandatory in those industries where other protective measures are not sufficient. Many reports have been written on the good results obtained by providing clean work clothing daily, and it is indisputable that protective sleeves, gloves, etc. are necessary to safe operation in many industries. The Medical Department, through its industrial hygiene section, should take the responsibility for seeing that such protective clothing is clean, sterilized and in good condition.

Role of the Hygienist

If dermatitis does develop, the industrial hygienist

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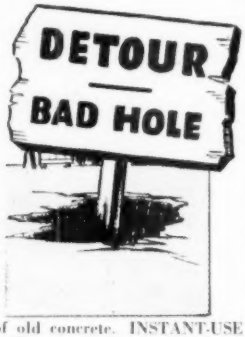

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can be of considerable help to the physician by tracing the sensitizer or irritant which is responsible. Investigation will often reveal a failure in the safe practice which has been set up, and the resulting dermatitis can be charged to human error rather than to a lack of foresight. He also can provide the necessary information concerning the prescription of protective creams in the case.

The history of the patient often provides a clue to the differential diagnosis. Neurodermatitis may precede, appear with, or it may follow an outbreak of regular occupational dermatitis and in most cases complicate the issue.[2] Here the investigation by the industrial hygienist, as much as the patient's history, often turns up predisposing causes of dermatitis and often a past history the patient has failed to mention. A history which reveals a dissatisfaction with the job or the foreman, or else a mental stress unconnected with the job must always be considered as at least a contributing factor. The case of the unhappy truck driver in an Army hospital detachment is recalled vividly as an illustration. This unfortunate soldier suffered with a severe neurodermatitis of both hands which cleared completely in a week's time when the patient was advised he was to be processed for release from the service and returned even more quickly when subsequently he was advised that rather than be processed for release he was to be sent overseas. Such cases must always be viewed with a good deal of skepticism before being accepted for compensation. One writer has even suggested that legislation be written to limit the period of compensability of such cases. This, indeed, should be done.[2]

If, in the opinion of the physician, a patient should be removed from further exposure to sensitizers and irritants, a letter of restriction should be directed to the department in question and other work found for the patient. Here again the industrial hygienist is of assistance in passing on the suitability of the new job with reference to its potentiality for causing the patient further trouble.

The employment of a consulting dermatologist, for those cases of difficult diagnosis, will save time and money, for many cases can be ruled out of the occupational bracket when expert diagnosis is made by the dermatologist.

Considered a necessity, also, is the control of all incoming materials by the industrial hygienist through the purchasing department. Without such control many dermatologically dangerous materials can slip into use in a plant and do their damage before the medical department is aware of their existence. A routine liaison with the purchasing department will enable a check to be kept on all materials, and in the case of those agents known to cause trouble, safe handling practice can be set up before the material is used, thus preventing much future difficulty. The same procedure followed through the engineering department or management's office will enable the industrial hygienist to keep informed about new practices and

processes, so that control can be applied before the process is put into use.

Orientation of supervisory personnel, educating them to promptly refer all cases of skin trouble, however slight, to the medical department will prove the few minutes required to be worth the effort many times over in the avoidance of dermatological headaches.

The instruction of nurses in medical facilities removed from the main hospital or dispensary, to maintain a "high level of suspicion" of all skin disorders and promptly refer such cases for diagnosis by a physician will uncover minor skin ailments which might otherwise go unnoticed until in an advanced state. Nurses should also be instructed to promptly report the occurrence of more than one skin disturbance in a given department—for such an occurrence would suggest a breakdown in some phase of the established control.

In summary, the control of occupational dermatitis requires careful preplacement examination, provision of protective measures, control and supervision of skin cleansers, soaps, etc. In the treatment of the patient, the industrial hygienist can aid the physician by tracing the offending agent and by preventing further contact through protective measures or substitution. The fostering of a "high level of suspicion" among nurses and supervisors makes for early case finding.

REFERENCES

(1) Levin and Behrman: Neurodermatitis and Occupational Dermatitis. N. Y. State J. Med. 46:19.

(2) Morris, G. E.: Skin—The Fragile Element in Industrial Production. Ind. Med. 17:6.

From an address presented at the 16th Annual Regional Safety Conference of the Philadelphia Safety Council.

Problem Drinker in Industry

"THE Problem Drinker in Industry," a 20-page booklet prepared by the Industrial Relations and Public Relations divisions of Allis-Chalmers Manufacturing Co. sets forth the role of supervisory personnel in the company's program to help the alcoholic.

The booklet, enlivened by appropriate drawings, tells why people drink, explains improper approaches to the problem, gives the reason for Allis-Chalmers' interest in the matter and how it is being handled by the company.

Charts which supplement the booklet show that in 1947 and 1948 more than eight percent of 71 problem drinking employees' working time was lost through absenteeism. After the company's alcoholic counselor took over on March 15, 1949, the absentee rate fell below three percent, and the loss in wages of the 71 dropped from over $23,000 in 1948 to about $13,500 in 1949.

The booklet states: "Assuming that the problem drinker is a sick man, the committee studying the problem of alcoholism at Allis-Chalmers has investigated to see what other *(Continued on page 66)*

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THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Diet and Arteriosclerosis

THERE appears to be some doubt and conflict of opinion as to the ultimate cause of arteriosclerosis and the effect of specific diets in the possibility of preventing this condition. A professor of nutrition in one of our leading eastern universities recently presented her rules of good nutrition for persons past 40. They were as follows: (1) Drink plenty of water. (2) Center diet on milk, fruits, vegetables, bread, and whole grain cereals with moderate amounts of eggs and meat. (3) Keep thin by limiting use of sugar, alcohol and excess fat. (4) Use fruits, as apples, for dessert. (5) Study chemicals listed on food wrappers as being ingredients of bread, etc. (6) If more vitamins and proteins are desired, use dry brewer's yeast and wheat germ instead of synthetic vitamins. (7) Use whole wheat and dark rye breads. (8) Study food guides. (9) Use dry skim milk, if necessary. (10) Add new foods to diet. At about the same time an article appeared in a leading medical journal indicating that the ingestion of the usual number of eggs and amount of meat would hardly affect the amount of cholesterol—a presumed cause of arteriosclerosis—that the average adult consumes. Some have strongly advised the limitation or at least restriction of eggs and meats if prevention of arteriosclerosis is to be achieved. These foods are excellent sources of many important nutrients, as protein, calcium, iron and certain vitamins. Their elimination from the diet, this medical journal article holds, in the hope of avoiding arteriosclerosis does not seem justifiable on the basis of present scientific evidence.

Varied Factors in Allergy

THE frequency with which a long list of substances prove troublesome to individuals who are allergic to them is well recognized. Specific tests will pick out one or many plants, foods and other substances in a considerable percentage of the population. The reasons why this is so may not always be understood. Some recent investigations on glandular abstracts are helping to throw some light on the subject, and at the same time to open up other avenues of investigation. On the other hand, recent investigations by physicians specializing in allergy and in psychosomatic medicine have indicated that the allergic pattern may be called forth in response to a variety of noxious experiences. Much current medical knowledge has been gained by exposing volunteers to various noxious substances under carefully controlled experimental conditions in order to study the psychosomatic reactions from the point of view of allergy. Apparently disease processes may occur as biologic patterns of defense set in motion by a variety of specific and non-specific threats to the integrity of the body. A major difficulty results when a worker develops some condition, such as a severe cough, a skin condition, a nasal condition—with each treated as an entity with little, if any, favorable result. It may be the medical care of a family physician, a plant or medical agency physician, and yet the condition does not improve. Careful investigation may give evidence of a truly allergic condition as the fundamental basis of the complaint. At other times some psychosomatic factor may be the real problem. Industrial nurses may often be able to interpret the reports of a complaining worker and suggest further reference to proper medical advisors.

Length of Life

STATISTICAL analyses by a large insurance company indicate the marked reductions in mortality since 1900. Women have gained more than men in this respect. Among women, the married have done better than the unmarried. Thus, at ages 20 and over, the death rate for married women has been cut in half—from 16 per 1,000 in 1900 to 8 per 1,000 in 1948, whereas for the unmarried the rate dropped only 40 percent. For men, the decline was less than one third among

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both the married and unmarried. Still throughout this period married men have enjoyed a considerably lower mortality than the unmarried at every age period; and in recent years women have been in the same situation. Marked social benefits have resulted from the large reduction in mortality among married people. It has added much to the stability of married life, especially in the earlier years of marriage when there are likely to be dependent children. At the same time, the more rapid improvement in mortality for women than for men has increased the chances that a wife will outlive her spouse. In addition, the duration of widowhood has been lengthened. Considering the fact that on the average married men are about three years older than their wives, the span of dependency may be lengthened irrespective of gain in longevity by married women. It is therefore evident that some form of insurance and savings are essential. An effective lesson can be taught by industrial nurses to men workers on this basis.

Disability Compensation

PAYMENTS for disability are increasing. In New York State a plan went into effect on July first. As a result of arrangements made by employers, more than half of the New York state wage-earners will receive sickness pay benefits which will exceed those required by law. Upwards of 200 insurance companies have qualified to enter this new field of insurance in New York. They include virtually all the life insurance companies, all the health and accident insurance companies and most of the casualty insurance companies licensed to transact business in the state. For some wage earners, the start of the new system will mean an increase in the deductions made from their pay by their employers. For others, some temporary deductions which have been in effect for six months will be eliminated. It is recommended that all industrial nurses in the few states that now have disability compensation laws should obtain copies of the laws and study them. They are often in a position to promote good public relations between management and workers. Sometimes the latter do not understand why certain specified deductions from their weekly wages are made. They can help to make this clear if informed. In other states where it is proposed to enact such legislation, nurses should obtain copies of proposed or introduced bills and study them. Any obvious serious defects in them should be brought to the attention of their superiors.

The A.M.A. Program

IN THE light of continued discussion as to the most desirable forms that the practice of medicine should follow, it is important to consider again the accepted

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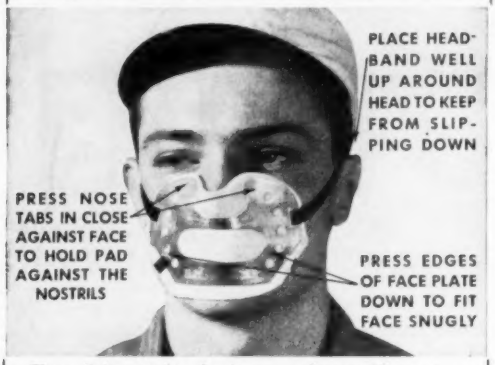
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program of the American Medical Association. Many physicians, as well as others who are not physicians, do not accept this program completely. But it represents the planning of the organization representing a very large portion of the physicians in this country. The principles are as follows: (1) Creation of a Federal Department of Health of cabinet status, with coordination and integration of all federal health activities under this department. (2) Promotion of medical research through a National Science Foundation. (3) Further development and wider coverage by voluntary hospital and medical care plans to meet the cost of illness. (4) Establishment in each state of a medical care authority to receive and administer funds with proper representation of medical and consumer interest. (5) Encouragement of prompt development of diagnostic facilities, health centers, and hospital services, locally originated with local administration and control. (6) Establishment of local public health units and services. (7) Development of a program of mental hygiene. (8) Health education programs administered by state and local health and medical agencies. (9) Provision of facilities for care and rehabilitation of the aged and those with chronic diseases. (10) Maintenance of existing high standards of medical care for veterans. (11) Greater emphasis on the program of industrial medicine. (12) Adequate support, with funds free from political control, of medical, dental and nursing schools. The forthcoming extensive publicity program of the A. M. A. will presumably further emphasize this set of principles.

They Lived Longer

ONLY a few years ago, the pneumonias were recognized as the causes of many deaths, particularly among the young children and the aged throughout the country. Pneumonias are still an important cause of death. However, the treatment of these conditions has been profoundly changed, first with the advent of sulfonamides, and more recently, the use of antibiotics. Of the latter, penicillin has been primarily responsible for the marked change that has taken place in the reduction of mortality at all ages. The use of this antibiotic in the treatment of pneumococcus pneumonia has in addition brought about a definite shortening of the febrile period, a decreased frequency of multiple lobe involvement and a greatly decreased incidence of complications. Not only are organic complications dependent on bacterial infection now rarely seen, but there has also been a sharp reduction of those physiological effects of pneumonia which were frequently present in severe cases, such as cyanosis, tachycardia, disorientation and delirium. The antibiotics have had a striking effect in streptococcus and staphylococcus pneumonias, and have been effective in some other rare complications. All of this success has led to increased longevity of many men and women who as recently as five years ago would not have survived a pneumococcus infection. That means an increasing number of available workers in the age groups of 50 years and over. It represents a great saving of human lives and social values. It is at the same time essential to plan effectively to make good use of the increased availability of men and women workers who have developed skills of value to industry, and who have passed the 50 or 60 year mark.

Problem Drinker in Industry

(Continued from page 63) industries may be offering in the way of treatment for these persons. The committee has found that only a few of the nation's industrial firms had been doing anything to treat this type of sickness.

"However, the Allis-Chalmers committee was able to profit from the experiences of these firms and also of the Yale Clinic. The help and information received was very valuable.

"Our committee at Allis-Chalmers then moved ahead on its own to set up a plan for treatment of problem drinkers. With this plan in operation, Allis-Chalmers becomes one of the pioneers to tackle the problem in a comprehensive manner. Naturally, the success of the work depends upon the cooperation of all in supervisory positions."

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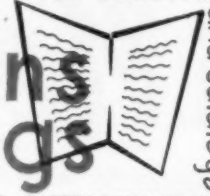

New publications of manufacturers are offered by SAFETY ENGINEERING Reader Service Department as a convenience to executives. Featured catalogs, data sheets and technical bulletins present the latest information on protective products and equipment.

PERSONAL PROTECTION

Two New Safety Shoes 1

Hy-Test Div., International Shoe Co. "There's always something new at Hy-Test" is the heading on each of two new 1-page bulletins. One describes and illustrates a brown leather general-purpose shoe with oil-resistant soles and heels. The other features a work shoe with Neocork soles for resistance to slipping and deterioration by oil, acid, caustic, or grease. Both bulletins point out that the shoes have steel box toes, steel arches, etc.

Catalog of Safety Shoes 2

Iron Age Div., H. Childs & Co., Inc. The newest catalog gives complete details on this company's complete line of safety footwear. With excellent illustrations, the 24-page catalog shows safety-toe shoes in work, dress and sport styles, boots, high-cut shoes, electrician's shoes and other specialty types. Also included is a price list and answers to safety shoe program problems.

Safety Eyewear Selector 3

Bausch & Lomb Optical Co. To aid industrial safety directors in choosing the proper safety glasses for 69 specific jobs, this compact, easy-to-use, slide selector should be very useful. The various safety frames applicable for each task are numbered and illustrated for identification.

Headrest Goggle 4

American Optical Co. This 1-page bulletin describes and illustrates a new headrest goggle that adjusts for any headsize easily and quickly. As pointed out in the bulletin, it is designed for the comfort and protection of welders, cutters, burners, brazers, furnace men, etc.

FLOOR MAINTENANCE

Patching & Resurfacing of Concrete Floors 5

The Master Builders Company. The Masterquick Method of maintaining concrete floors is described in this well illustrated 8-page bulletin. The iron asphalt patching material makes the repair of heavy-duty industrial floors a quick, economical procedure. Recommendations for use of the material are given and methods of application are diagrammed.

Formula for Floor Maintenance 6

Masury-Young Company. This SAFETY ENGINEERING reprint offers in 4-page, illustrated form a guide to the proper care of all types of floors. Also included is a valuable chart showing the correct treatment, dressing, and maintenance of wood, vitreous and resilient types of floors.

Sanitizing Floor Cleanser 7

James Varley & Sons, Inc. This 1-page bulletin describes "San-I-Floor," the cleanser which gets rid of germs as well as dirt. The bulletin points out that the product will not injure any type of floor and that its use promotes healthful working conditions.

FIRE PROTECTION

New Dry Chemical Extinguishers 8

C-O-Two Fire Equipment Co. This 4-page illustrated bulletin describes this company's new line of dry chemical fire extinguishers. Carrying both UL and FM approval labels, these extinguishers are suitable for Class B & C fires. The bulletin gives full details on their design and operation, and describes the simple method of recharging both the 20 lb. and 30 lb. sizes.

WASHROOM SANITATION

Horse Sense About Your Feet 9

Onox, Inc. This 4-page bulletin illustrated with cartoons gives you the facts about athlete's foot and the unique Onox method of preventing it through the use of a skin-toughening solution.

Foot Flush Pedal 10

Approved Products Co. This illustrated bulletin describes a new device which, when attached to any type of toilet stool, converts the flushing mechanism to one of the foot-operated type. By eliminating the need for operating the flush valve by hand, washrooms are more sanitary and more attractive.

STATIC HAZARDS

Conductive Rubber Casters 11

Faultless Castor Corp. This 4-page illustrated folder describes rubber wheel casters which ground the static charge and thus eliminate the explosion hazard in dangerous areas. Designed for hospital operating rooms, these casters have a resistance as low as 100 ohms per centimeter cube. They are available in various styles for different types of equipment.

SIGNS

Safety Slogan and Reminder Signs 12

Stonehouse Signs, Inc. This 4-page bulletin illustrated in colors shows various types of warning and slogan signs. Full specifications and prices are given for the various signs of painted metal, suitable for inside or outside use.

SAFE PRODUCTION MATERIALS

Silica-Free Abrasive 13

American Wheelabrator & Equipment Co. An illustrated 4-page bulletin describes "Black Beauty," the non-metallic, silica-free blast grit. With much the same properties as sand, there is no free silica to create an occupational hazard. It outwears sand, is less damaging to equipment, non-corrosive, stainless, rustless, and does not pack or harden.

Safety Turn Bar 14

Safety First Supply Co. A 2-page illustrated bulletin introduces a completely new turn bar to replace the dangerous homemade pinch bars in common use. The "Sup-R-Guy" Turn Bar provides great leverage in turning and handling steel shapes and plates manually, and reduces the possibility of accidental injuries to the foot and leg.

LINEMEN'S EQUIPMENT

Pole Setting Equipment 15

A. B. Chance Co. This 4-page illustrated bulletin shows that there are better methods for digging post holes. The right tools for this line construction job are shown as: pulley block, dump trip auger, expanding and tamping bar, never-creep installing bar, never creep maul, screw anchor wrench, pike pole, and running boards and swivels.

Hot Line Equipment 16

Bodendieck Tool Co. This large catalog gives the complete line of tools for linemen. Included are hot line clamps, live line maintenance equipment, safety grounding equipment, and trouble-shooters equipment.

TRUCKING SAFETY

Lantern & Torch Holder Stands 17

Purcel Enterprises, Inc. This 2-page bulletin describes and illustrates the various types of stands for holding kerosene torches, lanterns and flags well above the ground. By raising these emergency warning signals off the ground, they are more visible and are safe from snow, sleet or flooding water.

WOODWORKING SAFETY

Safety Shaper Collars 18

J. B. Chaffe. A series of bulletins describe and illustrate the Schmidt lock-edge shaper collar which prevents the knives from flying out and reduces the set-up time. Also shown are shaper heads and lock-edge knives.

BUILDING MAINTENANCE

Heat-Absorbing & Glare-Reducing Glass 19

Mississippi Glass Co. A new 12-page catalog describes "Coolite" glass, giving typical applications in industrial buildings, schools and institutions. Independent testing has confirmed the heat-absorbing and glare-reducing qualities of the glass. Light transmission tables and specification data are included.

Color Conditioning 20

E. I. duPont deNemours & Co., Inc. This new 32-page booklet shows the functional use of color not only in industrial plants but also in schools, offices, restaurants, stores, etc. The well illustrated booklet shows how to use color for safety, efficiency and morale.

WRITE NUMBERS CORRESPONDING TO THE ITEMS HERE ☛

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August, 1950

What's New . . .

★ For illustrated descriptive literature of products listed in this section readers may apply ★
TO SERVICE DEPT., SAFETY ENGINEERING MAGAZINE

ANTI-FOG CLOTH

THE Premier Anti-Fog Cloth is obtainable through the Bausch & Lomb Optical Company to prevent the formation of steam and mist on glass surfaces. It promises new convenience and added safety in industrial plants as well as in institutions and public buildings.

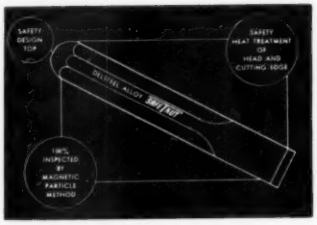
It is a scientifically impregnated cleaning and polishing cloth that forms an invisible protective film that lasts from 24 to 72 hours, depending on the exposure. This film not only prevents the formation of steam and mist, but also helps eliminate glare, and helps repel dust and dirt.

The product was developed in the laboratories of a nationally known chemical house and in cooperation with other scientists during wartime experimentation to find a way to prevent fogging of gas mask eyepieces. It should help in reducing accidents, speeding up production, as well as being a convenience in eliminating the fogging discomfort of eye protection equipment.

This cloth is offered in a handy size, 8½ x 4½, and is so packaged that the worker can carry it in his goggle case, overalls, or shirt without soiling or affecting the cloth. For details, use the coupon.

FATIGUE REDUCING MAT

A NEW synthetic rubber floor mat, tradenamed "Lam-Tex," has been introduced by Burgess-Berliner Associates, industrial development engineers of Illinois. Designed to reduce fatigue suffered by standing workers, the mat is porous and springy, and is said to resist rotting from age, moisture, oils and from chemicals used in the drycleaning and laundry industries. The pad is 20 by 36 by ½ inches, with beveled edges. For complete details, use the convenient coupon.


SAFETY DESIGN TOP
SAFETY HEAT TREATMENT OF HEAD AND CUTTING EDGE
DELSTEEL ALLOY
SAFE-T-KUT
100% INSPECTED BY MAGNETIC PARTICLE METHOD

SAFE-T-KUT TOOLS

THE Delaware Tool Steel Corporation is now marketing its line of Safe-T-Kut tool products. Tools in the Safe-T-Kut line consist of hand chisels, pneumatic and electric hammer chisels, center punches, paving breaker steels, back-out punches, blacksmith's tools, etc.

Safe-T-Kut tools are made from DEL-STEEL ALLOY, a patented analysis long used by the Delaware Tool Steel Corporation in its standard steel products. The Safe-T-Kut tool line differs from the regular line in its incorporation of special features that stress safety in use. The special safety features of Safe-T-Kut tools are as follows:

1. Magnetic Particle Inspection of each tool. This type of inspection will reveal any defects such as laps, seams, forging, grinding, or heat treating cracks not discernable to the eye. Defects of this type represent a dangerous condition in that they can break off into sharp, flying particles.

2. Special design of striking end of hand tools. This shape removes much of the metal coming in contact with the striking hammer. The design results in a diminished tendency of the tool to spall or "mushroom."

3. Special heat treatment of striking end of hand tools. Such a heat treatment produces a striking surface that is sufficiently hard to resist "mushrooming," but not hard enough to cause spalling.

A warranty is issued with each shipment of Safe-T-Kut tool products. The warranty states that all tools in the shipment have been inspected by the magnetic particle method and have been found free of any defects as can be revealed by this test. For further details, use the coupon.

NEW SAFETY GAUGE GLASS

THE Shomatic Safety Liquid Level Gauge, which has been approved by Factory Mutual Laboratories, is a self-contained unit replacing the usual tubular gauge glass that shows the liquids level in a tank or vessel. It is a product of the Hartford Machine Screw Co. of Connecticut. The Shomatic Gauge is a safety device designed to prevent the escape of harmful or costly liquids and gases.

Spacer balls contained within the glass serve to raise spring-applied ball checks from their seats. When the glass breaks the spacer balls fall out and the compression springs seat the check balls instantly and with a positive action—closing action is not dependent on escaping contents of the vessel. Both ball checks can be cleaned

without shutting down the system and with no danger of breaking the glass.

Double packing at each end eliminates strain on the glass should the gauge valves be off center. Liquid level is easily read as the spacer balls in the liquid appear oval, those above it round.

For complete details, send in the coupon.

PORTABLE DUST COLLECTORS

TO FILL a long-felt need in industry for a heavy duty portable dust collector, The Kirk & Blum Mfg. Co. of Ohio announces the new type "M" unit dust collector. Three models are available in 450, 900 and 1800 CFM at high velocity.

These heavy duty collectors can be set up anywhere to serve one or several machines for any period of time . . . or can be readily moved to meet changing needs. They eliminate the need for long, costly pipe runs to remote areas of a plant where one or a few machines are located.

The Type "M" units handle dust from grinding, buffing, and polishing metal-working machines and similar dust sources. Each unit consists of motor, exhauster, centrifugal pre-cleaner and steel wool filter after-cleaner.

In all sizes of the new Type "M" Collectors, the dust laden air is delivered to a small diameter, high efficiency, centrifugal pre-cleaner where all but the finest particles are removed. The air then passes through steel wool filter pads, three inches thick, for final cleaning.

Motor and exhauster are completely isolated from dust. The units are completely fireproof.

Where conditions will not permit the re-entry of cleaned air into the working area, the filters are replaced with air-tight closures and the air vented to the outside. Exhaust stack connections can be furnished at top or any side of the unit. Where it is desired to return the cleaned air to the building during the winter months to conserve heat and to vent it to the outside during the summer months to improve ventilation, the unit may be equipped with both exhaust stack and filters. The change is effected by merely turning a damper in the stack.

Maintenance is reduced to a minimum according to the manufacturer. The after-cleaner, readily accessible through an expanded metal, usually requires cleaning not more than once in two weeks, depending on usage. For details, use the coupon.

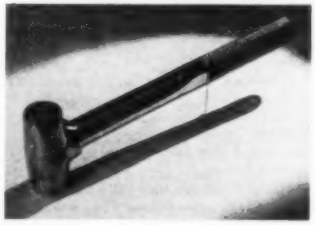
ELECTRIC EQUIPMENT CLEANER

EXTENSIVE field tests have proved the success of a new formula developed by the Du Pont Company for a cold liquid cleaner particularly suitable for use on electric motors and generators of varying size and effective for general machine and automotive maintenance.

During the last year tests under actual service conditions and industrial routine usage have shown that this compounded product, called "Cleaning Mixture #49," possesses the qualities required of an effective cold spray for use in electric motor cleaning, automotive repair, and general maintenance. It dissolves grease rapidly, evaporates quickly, and is practically inert to ordinary electrical insulating materials.

The mixture is composed of 30 per cent by volume "Blend CC No. 49" and 70 per cent Stoddard Solvent. "Blend CC 49" is now available from Du Pont distributors, many of whom are also prepared to supply the complete mixture. Stoddard Solvent is generally available, but is not manufactured or sold by Du Pont. Service shop owners and industrial maintenance departments who prefer to prepare the mixture themselves may do so readily by purchasing the ingredients.

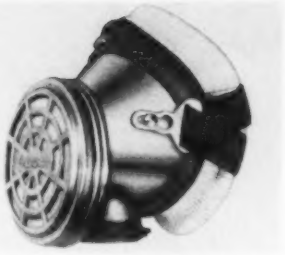
Because of its low flammability and mild toxicity, "Cleaning Mixture #49" is readily acceptable and desirable for use in electrical maintenance. For complete details, send in the coupon.



GILDING METAL HAMMER

THE gilding metal Safe-T-Hammer is a bronze hammer to be used in place of copper or brass hammers where it is desired to strike a hard blow without injuring delicate machine surfaces. Made by the Univertical Machine Co. of Michigan, the hammer is applicable in the manufacture of engines, transmissions, cutting tools, axles, motors, gears, aircraft, automobiles, tractors, trucks, in screw machine shops, tool and die rooms, die casting plants, etc.

The Safe-T-Hammer reduces accidents to work and workers. The light weight, electrically welded tubular steel handle is "diamond knurled" and somewhat flattened to assure a positive grip even when worker's hands are moist or oily. The all-metal construction prevents handle breakage, and it is so designed that the head cannot fly off. It is said to last 5 times as long as lead hammers, and 3 times as long as rawhide hammers. The danger of flying chips from steel hammers is eliminated. For details, use the coupon.



LEAD DUST RESPIRATOR

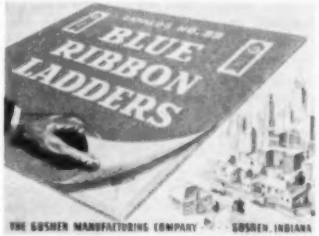
NEWLY designed and carrying approval of the U. S. Bureau of Mines for Lead Dusts, this new No. L-800 respirator may also be used for all known toxic dusts which are not significantly more toxic than lead. Available from the Pulmosan Safety Equipment Corp. of Brooklyn, it features lightness and compactness, using a single chemically treated felt filter, 3 1/16" in diameter, for low breathing resistance and low replacement cost.

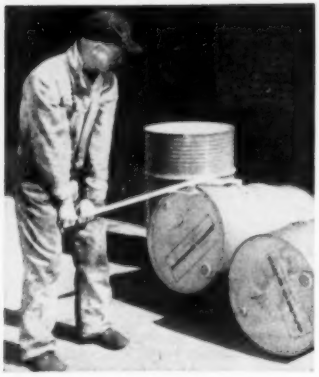
The new patented exhaust valve is compact in size, positive in action. All the metal parts are made from aluminum, permitting the facepiece to be bent inward or outward to fit any facial contour. It has double rayon elastic headbands, patented rubber face cushion, and knitted cushion covers. The respirator is easy to clean and service. All parts are replaceable. For details, use the coupon.

LADDER MANUAL

A UNIQUE ladder manual has been produced by The Goshen Manufacturing Company of Indiana, describing their complete line of Blue Ribbon Ladders and accessories. The manual identifies each type of ladder, gives specifications and illustrations, and includes descriptions of the type of work it should be used for. Details of construction and safety features are emphasized.

As pointed out in the manual, the Blue Ribbon Ladders exceed the specifications in the American Safety Code for Wood Ladders. Among the many designs offered are platform, five-in-one, folding, step, extension, sectional, trestle, extension trestle, and all types of straight ladders. Also shown are scaffold planks, extension planks, ladder shoes, stabilizers, metal points, wheel spurs, brackets, hooks, triangles and rollers. For a free copy of this ladder manual, send in the convenient coupon.





DRUM UPENDING TOOL

A NEW barrel and drum tool for upending, designed with a special tension clinching feature for positive safety, is announced by the D. S. Campbell Company, Cleveland, Ohio. The new drum and barrel handling tool, called E-Z-Up has no moving parts to slip or break. It promises to take the drudgery and hazard from drum handling, according to the manufacturer.

Specially designed V-shaped strap-iron saddles are located at the point of leverage and the point of lifting. The leverage saddle at the end of the tool laps over the top expanded rolling hoop, while the lifting saddle fits tightly to the drumhead at two points under the rim which supports the lifting weight. As leverage is applied, pressure forces the saddles to spread the grip the drum surfaces to prevent slipping or rolling.

This tension-clinching feature adds safety for workmen because drums cannot slip or roll, regardless of how greasy or slippery, states the manufacturer.

Weighing only 6 pounds, E-Z-Up is made of 1" heavy-wall tubing of all welded construction. Only 42" long, the handy drum and barrel tool is said to be easy to store when not in use. For further information about E-Z-Up, use the coupon.

CARBON MONOXIDE RECORDER

A REFINEMENT of the original widely-used M.S.A. Carbon Monoxide Recorder has been announced by the Mine Safety Appliances Company. Retaining all the valuable features of the former model, the new instrument is compact, easy-to-read, and provides precise and continuous measurement of very low concentrations of carbon monoxide in air. It is composed of a drier, analyzer and potentiometer recorder, and can be calibrated to a sensitivity or accuracy which is about ten times greater than that of most refined analytical determination. Sampling is implemented by a continuously operating motor-driven pump which forces the air sample through the drier and then through the analyzer where any carbon monoxide present is oxidized, and the percentage registered on the recording potentiometer. The potentiometer can be equipped with as many as six sets of discs and contacts to operate suitable warning signals, ventilation controls and proportioning valves.

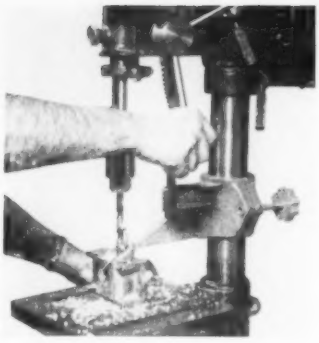
The improved M.S.A. Recorder is particularly designed for use in vehicular tunnels and garages; for testing gas-burning appliances; for research work in combustion studies; in testing various gases for possible carbon monoxide contamination and for control practices in producer gas, coal and water gas, blast furnace operations, hydrogenation, ammonia synthesis and many other practices. For complete details, send in the coupon.

FIRE DETECTOR

A NEW development in fire detection is offered by the Fireye Corporation of Mass. in its FIREYE Fire Protection System FD-10. Utilizing a photoelectric principle, the unit sees the fire without depending on heat, smoke or other indications that result from the presence of fire. The system provides complete coverage throughout a room or fire zone, but does not have to be located where it will be directly exposed to fire. It is said to be capable of detecting very small fires but will not react to extraneous light such as from the sun or lamps.

The FIREYE Protection Block, consisting of six detectors and one control panel, provides coverage up to 120 x 80 feet. Each detector will monitor an area within a radius of 20 feet. The system has a self-monitoring feature that gives assurance that the equipment is operating properly.

The FIREYE Fire Protection System has been expressly designed for ease of installation in industrial areas, homes, or on board ship. Connections can be made to existing alarm and automatic extinguishing equipment. The detectors are arranged in a series circuit and can be mounted on any standard 3" outlet box. For details, send in the coupon.



DRILL CLAMP

THE M E Engineering Co. of California is offering a new drill clamp that has been particularly designed to hold jigs, fixtures, work to be drilled, reamed, countersunk or otherwise machined on drill presses.

The M E Drill Clamp provides safety for the workman because its positive grip eliminates the danger of the work's whirling with the tool or climbing the drill. It reduces tool breakage caused by misalignment of work. The clamp is tightened by hand, and no tools or wrenches are needed to make the clamp hold the work firmly. The unit is easily mounted on the drill press column without removing the head. The clamp can then be swung into position for use whenever it is needed. For details, send in the coupon.

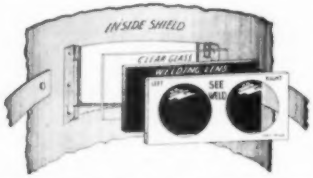
NEW INDUSTRIAL SWEEPER

A NEW development in motorized sweepers for use by industries, institutions and commercial firms—indoors and out—is announced by the Wayne Manufacturing Company of California. It is an all-enclosed, flush-bodied, motorized tri-wheel sweeper that steers like an automobile, sweeps like a regulation street sweeper, and is equipped with a new type vacuum dust control system that is said to assure dustless sweeping under extreme conditions. The new Wayne industrial sweeper sweeps a 42" swath at 6 miles per

hour and is reported to be capable of sweeping 100,000 sq. ft. of open area per hour. The over-all dimensions of the sweeper are: width, 46½"; length, 80" and height, 52".

Adapted to both indoor and outdoor sweeping, its dust control system draws dust into an easily emptied metal box. Automotive steering controls, plus its tri-wheel construction, make possible 90 degree turns. Sixteen-inch steel disc wheels, equipped with 6-ply puncture-proof pneumatic tires, enable the sweeper to ride over obstructions, car tracks, curbs, gutters, and up ramps.

The long fibers in the broom assure excellent sweeping and long wear. The brooms are replaceable at nominal cost. Adjustable tension on the pick-up broom enables it to sweep uneven surfaces and any type of floor, and to pick up such materials as chunks of metal, welding rod ends, metal shavings, wire, paper, cloth, string, wood blocks, rubber, dry cement—even grease, oil and water. For details, use the coupon.



MAGNIFYING WELDING LENSES

NOW available is a plastic plate in which has been inserted ground and polished optical lenses of different focal or magnifying powers. Called SEE-WELD, these plates provide better vision for welders when used in welding helmets or hand shields. They are made by the Buell W. Nutt Co. of California.

Welders who wear bi-focal spectacles have difficulty in seeing their work because of the necessity of tilting the head back to use the near-vision part of the lenses. With SEE-WELD plates inserted in the helmet itself, the welder can hold his head in a normal position. The plates are also advantageous for use with spectacles giving only distance correction and where it is desirable to provide the addition of near-point vision to relieve eye strain.

To provide for the varying visual requirements of different welders, SEE-WELDs are regularly supplied in six focal or magnifying powers, and special prescriptions can be made to order. For complete details, use the convenient coupon.

DRUM HEAD CUTTER

A HEAD CUTTER that cuts the head of any size drum, clean, in approximately one minute has recently been introduced by Michael A. Schinker Mfg. Co., of Illinois. It works equally well on empty or filled drums, from 10 to 55 gallon sizes and 20 to 16 gauge stock. It rests on the

top of the drum, and manual turning of the crank causes it to complete the circle of the drum. The head will drop into the drum while the cutter remains resting on the open drum. The cut leaves no ragged edges and the metal is flanged slightly inward. The cutter blade will cut about 1000 heads before dulling and can be resharpened.

The cutter weighs 36 lbs. and is said to be safe for use on drums containing dangerous vapors. Dangerous torch cutting, saw-toothed edges, hammer and chisel noise of cutting heads are eliminated. The Head Cutter also doubles for sealing leaky chimes. Cutter wheel is replaced with a roller wheel.

Further details may be had by sending in the coupon.

NEW PRIMARY BATTERY

A NON-RENEWABLE, air-depolarized add-water type primary battery, the "Carbonaire," recently introduced by Thomas A. Edison, Incorporated, is expected to find application in many fields. First widespread use will be in converting oil-burning railroad switch-lamps to electrical operation at a saving to the railroads of as much as $25 per lamp per year. This saving is possible because of the elimination of weekly or twice-weekly servicing. The new Carbonaire battery will supply enough electricity to keep a switch-lamp going for ten months to a year with only occasional inspections.

The present size Carbonaire, and others now being planned, will be suitable for many applications such as fire and burglar alarm systems, annunciator systems, elevator signals, laboratory apparatus, aids to navigation, telephone and telegraph installations, time clock systems, communication systems and other services that require a reliable, independent source of low voltage D-C energy.

The 1000 ampere-hour model now in production contains two series cells sealed in a single, molded, hard rubber case. Dimensions are 8¼" x 7¼" x 9½". Like other primary batteries, the Carbonaire is not chargeable and is replaced when expended. For further information, send in the coupon.

PLASTIC CLOTH CLOTHING

DEVELOPMENT of a line of all-plastic cloth protective garments which promises to revolutionize the use of such garments has just been announced. The new garments, available from The Milburn Company of Michigan, are much lighter in weight—only 5½ ounces per yard—are far cooler and more comfortable to wear.

In the past workers have shown considerable opposition to wearing protective garments. All were heavy, warm, and uncomfortable. These new garments, however, are lighter than twill. They have the abrasive and tear strength of Nylon. For maximum protection and strength, seams are sewn with thread of the same material. They can be laundered with soap and water. The cost is nominal.

Two types of cloth are available. One is a plastic thread tightly woven into a cloth which looks and feels like silk. This material is ideal for fumes exposure to acids, caustics, solvents, and oil. Experiments have conclusively proven that the garments will withstand a 20-hour immersion test in almost all important acids and solvents. The second cloth uses the same base as the first, but is then lightly coated with a clear vinyl plastic. It is only slightly heavier, but is intended for use where actual contact with oils, acids, caustics, or petroleum solvents requires maximum protection. Both are non-flammable. For additional information, use the coupon.

August, 1950

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